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FOREWORD

The *United States Armed Forces Medical Journal* is the medium for disseminating information of administrative and professional interest to all medical personnel of the Department of Defense. The Assistant Secretary of Defense (Health and Medical) and the Surgeons General of the several services invite all medical officers, dental officers, Medical Service Corps officers, Nurse Corps officers, and officers of the Veterinary Corps of the Armed Forces, and the medical consultants of the Army, Navy, and Air Force to submit manuscripts for publication in this *Journal.*

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Monthly Message

Guy de Chauliac was the last of the great mediaeval surgeons and is considered by some the greatest. Unfortunately, however, he denied the theories so well-stated by Theoderic and Henri de Mondeville that wounds should heal by first intention and, when clean and dry, should be treated by primary closure. Guy considered this to be false teaching and went back to the authority of Galen in the use of large drains or "tents" to create suppuration. Nevertheless, Guy's contributions were great and he believed thoroughly in the basic knowledge and *complete education* of a surgeon. Hence he states "the four qualities of a surgeon":

1. *Lettré,* which means that he should be educated and literary, should understand the theory and practice of medicine, geometry, astronomy, philosophy, and the natural sciences. Otherwise he is no different from an ordinary artisan.

2. *Expert,* which means he should be expert in the use of his hands. He must wish to operate and understand the technic of operating.

3. *Ingenieux,* which means he should have good judgment and memory. He should have a firm hand, clear eye. He should have good intentions and should understand the subject of surgery.

4. *Morigeré,* which comes from the Latin *morigeratus* and means compliant, agreeable, accommodating, anxious to please. He should be bold, yet fearful of dangers. He should shun fakes and charlatans. He should be wise, kindly, sober, and compassionate. His fee should be moderate and formed in accordance with the task and the patient's ability to pay.

There is little to criticize in the above, although today, perhaps, certain substitutions or additions might be made to these qualifications. I would call your attention particularly to the phrase "Otherwise he is no different from an ordinary artisan." That the physician and surgeon should be educated in the full sense of the word there can be no doubt, and here one may adopt A. N. Whitehead's definition of education: "Education is the acquisition of the art of utilization of knowledge."

Frank B. Berry

FRANK B. BERRY, M. D.
Assistant Secretary of Defense
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EFFICACY OF ERYTHROMYCIN IN THE TREATMENT OF ACUTE RESPIRATORY INFECTIONS

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ACUTE respiratory infections have constituted one of the major economic and administrative problems in military populations.[1] Recruits undergoing basic training have generally been more affected than other more permanent personnel on the base. Any means of prevention or rapid cure of these respiratory infections would be of obvious value. Because streptococcal infections have occurred frequently in military populations,[2-6] considerable information is now available on their prophylaxis and treatment. The sulfonamides and most of the antibiotics have been shown to be of value in prevention and control of these infections, as in other bacterial infections susceptible to the particular chemoprophylactic agent employed. The therapy of viral and related infections has to date been singularly disappointing, as pointed out by Finland in a review article.[7] The use of the available antibiotics in the treatment of the common respiratory diseases with nonbacterial causes has not been shown to alter the course of the clinical illness significantly.[7-15]

If an antibiotic were therapeutically effective, it might be used either for prophylaxis or treatment of the infection in the manner that penicillin is used for controlling streptococcal infections in military populations. The present study was undertaken to obtain further information on one of the newer antibiotics, erythromycin,[16] and to determine what effects its use might have on the course of the respiratory infections prevalent among recruits.

PATIENTS, MATERIALS, AND METHODS

Selection of Patients. The 269 male Navy recruits included in the present study were observed and treated at one regimental infirmary of this training center between 7 November 1952 and 3 March 1953. As these recruits presented themselves at the various sick calls with complaints referable to the respiratory

From Naval Medical Research Unit No. 4, U. S. Naval Training Center, Great Lakes, Ill.

tract, it was first determined if the illness warranted admission to the infirmary ward. The main criterion for admission was an oral temperature of 100° F. or greater, although two patients who had exudative pharyngitis and temperatures below 100° F. were included. The patients admitted were then assigned in strict rotation to one of the three treatment regimens as outlined below. No attempt was made to determine the exact diagnosis before assigning a patient to a treatment schedule. Only patients with respiratory infections were included, and the only exception to the consecutive order of assignment was to eliminate men who had received antibiotic therapy for any reason within one week of the admission. Four patients were excluded from the final analysis: two were later found to have postinoculation reactions rather than respiratory infections, and two were transferred to the naval hospital before completing one day of therapy.

Treatment Regimens. The patients were assigned in rotation to one of the following treatment schedules:

1. *Erythromycin.* On admission, 200 mg. of erythromycin were given by mouth; this was repeated every four hours thereafter for a minimum of three days. The total daily dosage was always 1.2 grams.

2. *Penicillin.* On admission, 300,000 units of penicillin G (aqueous crystalline penicillin G), and 300,000 units of aqueous penicillin G procaine were given intramuscularly. Thereafter each patient received 300,000 units of the penicillin G procaine preparation every 12 hours for a minimum of three days.

3. *Placebo.* These were tablets identical in size, shape, and color to the erythromycin tablets, and were given on the same schedule for a minimum of three days.

The patients were assigned to a treatment regimen by a hospital corpsman as their names were logged on admission, the tablets were dispensed by the ward nurses and corpsmen, and the medical order sheet was not inspected during the patients' ward stay except in the event of a complication or delayed recovery. In this manner it was believed that as little prejudice as possible would be injected into the data comparing the erythromycin and placebo groups.

In addition to these specific treatment regimens, all patients were given routine supportive and symptomatic therapy. This included bed rest until the patient was afebrile, nose drops and gargles when needed, and adequate fluids. The routine use of antipyretic drugs was specifically interdicted in all patients.

Clinical Observations. Following admission to the ward, each patient was interviewed for the pertinent facts of the medical

history, and a complete physical examination was made. In addition to the usual records, a separate marginal punch card was maintained for each patient to facilitate the tabulation of the clinical data. Ward rounds were made twice daily, at which time notes were made in the medical records and on the punch cards as to the status of the patient, persistence of symptoms or physical signs, unusual developments or complications, and reactions to the treatment given. Each patient's oral temperature was obtained four times daily, and the daily maximum temperature was recorded on the punch cards.

Laboratory Observations. At the time of admission the following clinical laboratory procedures were performed on each man: total leukocyte count with differential blood smear, complete urinalysis, nose and throat culture, blood culture, and withdrawal of a 50-cc. blood sample. Sputum cultures and mouse inoculations were performed when indicated. The leukocyte counts were repeated each morning until they were persistently below 10,000 per cc. Other laboratory examinations were repeated as indicated. A second blood specimen was collected between the fourteenth and twentieth days following admission. A roentgenogram of each patient's chest was made upon admission, and repeated when indicated.

Bacteriologic, Virologic, and Serologic Observations. Cultures of the nose and throat were part of the initial laboratory testing of each patient. These cultures were obtained under direct vision with the aid of a strong white light in a miner's type head lamp. Additional cultures were obtained daily while the patient remained in the infirmary. Cultures were also obtained at convalescent follow-up visits on about the fourteenth and twenty-first days. All patients had cultures for at least four consecutive days, and the majority for six or more days. All cultures were processed by the technics usually followed in this laboratory.[17] Particular attention was paid to hemolytic streptococci, and all strains isolated were subjected to serologic grouping and typing by the precipitin method.[18]

On admission, and again on the third hospital day, 5 cc. of blood were obtained aseptically, and cultured in 50 cc. of broth medium. These cultures were incubated at 37° C. for at least seven days, and any suggestion of growth as evidenced by hemolysis, darkening of the blood, or turbidity in the medium was checked by streaking onto sheep's blood agar plates for identification of the bacterial species.

No consistent attempt was made to isolate influenza viruses from the patients in this study, but between 12 December 1952 and 13 February 1953 nasal washings were obtained from 24 patients whose illnesses the medical officer thought to be due

to influenza. The majority of these washings were obtained during the first two weeks of January. All were inoculated intra-amniotically into 13-day-old embryonated eggs for the isolation of influenza viruses by the technics usually employed in this laboratory.[17]

The two blood specimens were used for determination of antistreptolysin O titers,[19] and for detection of antibodies against the PR8, FM1, Lee, and 1953 prototype influenza virus strains.[20] Where for any reason both sera from a patient were not available, the single titer was disregarded. To be significant, a rise in antistreptolysin O titer required an increase of 0.3 log (three tubes) or greater, and in the Hirst hemagglutination-inhibition test for influenzal antibodies a fourfold or 2.0 log rise in titer was required to be significant.

ANALYSIS OF CASES OBSERVED

Comparability of Populations. Because no regard was given initially to the admission diagnosis or medical history in assigning the patient to a treatment regimen, it is important to assess the comparability of the populations in the three groups before comparing the results of the therapy given. In table 1 are listed certain of the pertinent facts of the medical history. Although minor variations did occur from one group to another, they were not significant. In addition to the medical history, calculations were made of the mean age, geographic origin, and number of weeks in training. These also were about equal.

Diagnostic Criteria. At the outset of the study it was known that the final series of cases would include acute respiratory infections of various causes, most of them unknown. It thus became necessary to classify these infections into etiologic groups on the basis of the available clinical, bacteriologic, virologic, and serologic data. For this purpose, certain somewhat arbitrary criteria were established, and the following diagnostic categories were included:

1. *Streptococcal infection.* (a) Exudative pharyngitis with a positive culture for a group A streptococcus; (b) any acute respiratory infection accompanied by a significant rise in antistreptolysin O titer; and (c) any acute respiratory infection with a positive culture for a group A streptococcus, and a total leukocyte count of 16,000 per ml. or greater.

2. *Influenza.* An acute respiratory infection associated with the isolation of an influenza virus and/or a significant rise in influenza antibody titer.

3. *Pneumonia.* An acute respiratory infection with roentgenographic evidence of pulmonary consolidation.

4. *Respiratory infection of unknown cause (RIUC).* An acute respiratory infection with or without constitutional symptoms, unrelated to the isolation of a streptococcus or an influenza virus, or to changes in antibody titers to these organisms. (All infections which could not be classified into group 1, 2, or 3 were listed as RIUC).

TABLE 1. *Some aspects of medical history in 265 naval recruits with acute respiratory infections*

Treatment group	Number of men	Percent with history of				
		Tonsillectomy and adenoidectomy	Allergy*	Recent upper respiratory infection**	Rheumatic fever	Penicillin sensitivity
Erythromycin	87	42.5	5.7	39.1	1.1	1.1
Penicillin	90	50.0	10.0	45.6	2.2	2.2
Placebo	88	48.9	10.2	45.5	3.4	1.1
Total	265	47.2	8.7	43.4	2.3	1.5

*Hay fever, hives, asthma, or known drug allergies.
**Within two weeks prior to present illness.

It should be noted here that the incidence of recruits presenting themselves at the infirmaries seeking treatment for respiratory infections is more or less continuous. The actual admission rates for respiratory infections are greater in the winter months, but unless epidemics are superimposed on the basic rates, the distribution of infections by each diagnostic category remains about the same. During the present study, there was an explosive outbreak of epidemic A-prime influenza virus infections in this population, beginning the last week in December 1952, and extending through the early weeks of January 1953. The six A-prime influenza virus strains were isolated, and most of the rises in antibody titers occurred during this period. During the study there was no definite evidence of streptococcal infections being epidemic. The persons so classified were evenly distributed throughout the period of the study.

In table 2 are listed the number of patients in the three treatment groups who fell into each of the diagnostic categories. It is immediately evident that although the initial diagnosis had no effect on the assignment of a man to a treatment schedule, the numbers in each diagnostic group are about equal. More than half the patients in each group were thought to have respiratory infections of unknown cause. It should be pointed out here that it is entirely possible that some of these patients had had strep-

TABLE 2. *Final diagnoses established in 265 naval recruits hospitalized for acute respiratory infections*

Diagnosis*	Treatment group						Total	
	Erythromycin		Penicillin		Placebo			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Streptococcal infection	23	26.4	23	25.6	30	34.1	76	28.7
Influenza	13	14.9	14	15.6	10	11.4	37	13.9
Pneumonia	1	1.1	1	1.1	3	3.4	5	1.9
RIUC**	50	57.5	52	57.8	45	51.1	147	55.5
Total patients	87	100.0	90	100.0	88	100.0	265	100.0

*See text for diagnostic criteria for each category.
**Respiratory infection of unknown cause.

TABLE 3. *Clinical features of illness in 260 naval recruits with acute respiratory infection*

Symptom or sign	Diagnosis						Total	
	Streptococcal infection		Influenza		RIUC*			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Malaise	66	86.8	33	89.2	103	70.1	202	77.7
Headache	51	67.1	23	62.2	62	42.2	136	52.3
Chilly sensations	50	65.8	21	56.8	58	39.5	129	49.6
Myalgia	24	31.6	18	48.6	26	17.7	68	26.2
Arthralgia	6	7.9	2	5.4	2	1.4	10	3.8
Coryza or nasal congestion	38	50.0	23	62.2	108	73.5	169	65.0
Sore throat	69	90.8	29	78.4	129	87.8	227	87.3
Tender cervical nodes	36	47.4	8	21.6	13	8.8	57	21.9
Dysphagia	38	50.0	0	0.0	4	2.7	42	16.2
Pharyngeal exudate	54	71.1	2	5.4	6	4.1	62	23.8
Negative throat examination	10	13.2	27	72.9	93	63.3	130	50.0
Cough, nonproductive	34	44.7	25	67.6	84	57.1	143	55.0
Chest pain or aching	0	0.0	7	18.9	3	2.0	10	3.8
Anorexia	17	22.4	5	13.5	30	20.4	52	20.0
Nausea and vomiting	2	2.6	0	0.0	4	2.7	6	2.3
Diarrhea	1	1.3	0	0.0	5	3.4	6	2.3
Total patients	76	100.0	37	100.0	147	100.0	260	100.0

*Respiratory infection of unknown cause.

tococcal infections with the initial culture being negative and the subsequent cultures and rise in antistreptolysin O titers being obliterated by antibiotic therapy. The main defense of the criteria as listed above lies in the placebo group, in which there were 0.3 log rises in antistreptolysin O titer in 58.6 percent of the patients. Conversely, some of the patients classified as influenza or streptococcal infections may have actually been suffering from other illnesses. The limitations in classification of respiratory infections lie largely in laboratory technics for isolation of causative agents and measurement of immune responses. It is presumed that most of these infections were of viral cause inasmuch as known causative agents have not been demonstrated.

Clinical Features. It was next of interest to determine if a retrospective analysis of the prominent clinical features of each of the types of respiratory infection would lend any information that would be helpful in differential diagnosis of similar cases in the future. In table 3 are shown the major systemic and local symptoms and signs in the three main groups. The five patients with pneumonia were excluded from this analysis as being too few to consider. In general, it is evident that the presenting clinical picture was about the same in those illnesses classified as due to a bacterium, the streptococcus, or to the influenza virus, or those of unknown causes. The significant exceptions include the greater incidence of pharyngeal exudate, dysphagia, and tender cervical nodes in streptococcal infections, and the increased prevalence of nonproductive cough and substernal aching in influenzal infections. These data clearly indicate the problem in differential diagnosis of acute respiratory infections, and, when coupled with the present day inadequacies of the laboratory, the problem becomes enormous in evaluating the therapy of these infections.

Most of these patients felt ill; a great majority of them complained of sore throat, and about two thirds had either coryza or nasal congestion. About half of the group complained of headache, chilly sensations, and a cough, which was almost always nonproductive. Other signs and symptoms occurred with much less regularity. Gastrointestinal symptoms were especially rare.

The following calculations were made on the 189 patients thought to have had nonbacterial infections. The onset of the respiratory infection was rapid, with more than three fourths of the recruits seeking treatment within 48 hours of the onset of the first symptom (table 4). The three treatment groups were comparable in this respect. About half of the patients had initial temperatures between 100° and 101.9° F. and the remainder had oral temperatures in excess of 102° F. The leukocyte count

TABLE 4. *Selected observations and findings in 189 naval recruits with nonbacterial respiratory infections*

Observation	Treatment group						Total	
	Erythromycin		Penicillin		Placebo			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
*Onset < 24 hours	35	54.7	37	55.2	30	51.7	102	53.9
Onset 25-48 hours	19	29.7	17	25.4	17	29.3	53	28.0
Onset > 48 hours	10	15.6	13	19.4	11	18.9	34	18.0
Initial temperature < 100 F	1	1.6	0	0.0	1	1.7	2	1.1
Initial temperature 100-101.9	31	48.4	35	52.2	27	46.6	93	49.2
Initial temperature 102 or >	32	50.0	32	47.8	30	51.7	94	49.7
Initial WBC < 10,000	25	39.1	19	28.4	25	43.1	69	36.5
Initial WBC 10,000-11,900	15	23.4	16	23.9	10	17.2	41	21.7
Initial WBC 12,000-15,900	16	25.0	21	31.3	13	22.4	50	26.5
Initial WBC 16,000 or >	8	12.5	11	16.4	10	17.2	29	15.3
Total patients	64	100.0	67	100.0	58	100.0	189	100.0

*Onset: Number of hours from first symptom to admission.

was below 10,000 per cc. in 37 percent of the patients, between 10,000 and 11,900 in 22 percent, between 12,000 and 15,900 in 26 percent, and over 16,000 in 15 percent of these patients.

RESULTS OF TREATMENT

In spite of the fact that a tabulation of signs and symptoms revealed no differences from one diagnostic category to another, or from one treatment group to another, it was believed that an analysis of the results of the various therapies employed must be made separately for each type of infection. This was done for each of the four categories as outlined above. The patients with pneumonia were too few for any critical evaluation. The two patients receiving antibiotics recovered uneventfully, as did one of the three on placebos. In the two other instances, specific antibiotic therapy was instituted, and these patients recovered promptly. The patients with streptococcal infection were excluded because of the bacterial cause. Parenthetically it may be stated here that the results of therapy of these patients were identical to those previously obtained in the treatment of similar infections by this unit.[21,22] Erythromycin and penicillin were equally effective in abbreviating the total duration of illness, in eradicating the streptococcus from cultures of the throat, and in shortening the duration of fever and leukocytosis in these patients.

When these calculations were made for the other types of infection, namely, influenza and those of unknown cause, the results were identical. Because it was assumed that the illnesses had many clinical and laboratory similarities, the separate results are not given here. The detailed results which follow are the composite analysis for the group of 189 patients with presumptive nonbacterial infections. Minor variations which occurred from one treatment group or one diagnostic group to another were not significant.

Clinical Effects. The persistence of each of the presenting symptoms was noted daily by the medical officer, and recorded. In general, it may be said that there were no outstanding differences between those receiving either of the two antibiotics and those on placebos. The symptom of sore throat, for example, persisted equally long in all three treatment groups. By and large, all patients were free of both local and systemic symptoms by the fourth hospital day. Similarly, the physical signs of the infection disappeared with equal regularity in all groups. No secondary complications occurred in any patients.

Duration of Fever. The daily maximum oral temperature having been recorded, fever was arbitrarily said to be present so long as the temperature did not maintain a sustained level below

99.5° F. Thus the duration of fever could be calculated for each patient. In figure 1. are shown the curves for each of the treatment groups. The duration of fever was virtually identical in all patients regardless of the treatment regimen employed. The apparent prolongation in the placebo group between the fourth and eighth days represents only one patient with pneumonia, and as such is not significant. Most of the patients were afebrile on the third hospital day, and this was usually accompanied by obvious evidence of clinical improvement as well. Neither erythromycin nor penicillin had any advantages over a placebo preparation as regards the duration of fever in these patients.

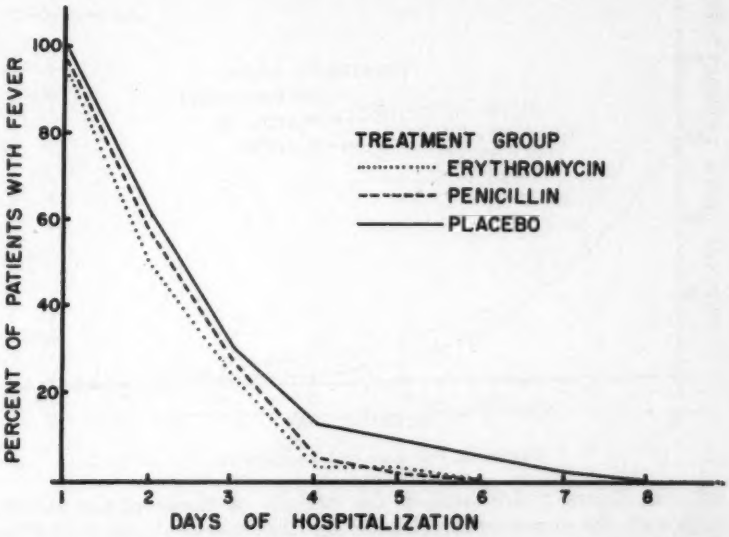

Figure 1. Duration of fever.

Duration of Leukocytosis. Similarly, the daily total leukocyte counts were tabulated, and leukocytosis was arbitrarily adjudged present as long as these counts were not persistently below 10,000 per cc. The duration of leukocytosis in each of the three treatment groups is plotted in figure 2. Although the penicillin group reflects a slightly greater number of patients with an initially elevated leukocyte count, for all intents and purposes the duration of leukocytosis was identical in each group. There was an abrupt decline in counts within the first 24 hours of hospitalization, and a steady and progressive decline thereafter. Only an occasional patient had leukocytosis persisting beyond the fourth hospital day. These findings generally paralleled the clinical improvement in the patient.

Total Duration of Illness. Having established the time of onset of each respiratory infection as nearly as possible at the time of admission, it was then feasible to calculate for each patient the total duration of the illness from the onset of the first symptom to the time when the patient appeared clinically well, irrespective of laboratory findings. Because most of the patients were seen within the first 48 hours of the onset, and all patients were entered into one of the three treatment regimens immediately upon admission, it would seem that this comparison is a valid

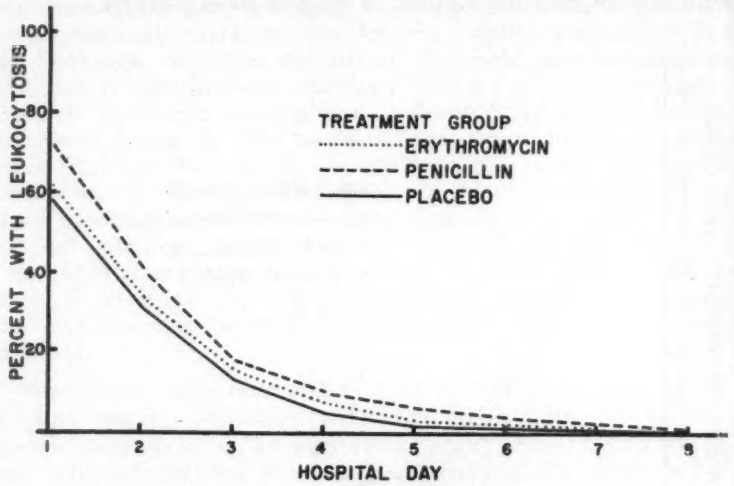

Figure 2. Duration of leukocytosis.

one. In figure 3 are plotted the results of these observations. Although the duration of illness for the placebo group appears slightly longer than that for the erythromycin and penicillin groups, the difference is not significant. By this criterion it cannot be stated that antibiotic therapy of these infections offers any advantages over a placebo.

Effect on Cultures for Group A Streptococci. On admission to the infirmary, about a third of the entire group of 265 patients had cultures of the nose and/or throat which yielded group A hemolytic streptococci. When the final diagnoses were established on the basis of all available information, it was evident that in 14 patients, or 5.3 percent of the total group, the streptococci could not be causally related to the acute respiratory infection. The results of the daily nose and throat cultures were tabulated, and the number of patients harboring group A streptococci was plotted for each day, as shown in figure 4. Upon

institution of either erythromycin or penicillin therapy there was an abrupt decline in the number of positive cultures, with few patients still yielding group A streptococci after the third hospital day. This effect was maintained for a few days subsequent to discontinuation of therapy, which generally occurred about the fifth day. At the time of the convalescent follow-ups, on about the fourteenth and twenty-first days, a significant number of these patients again harbored streptococci. In contrast to the two antibiotic-treated groups is the placebo group, in which there is a much slower but progressive decrease in the

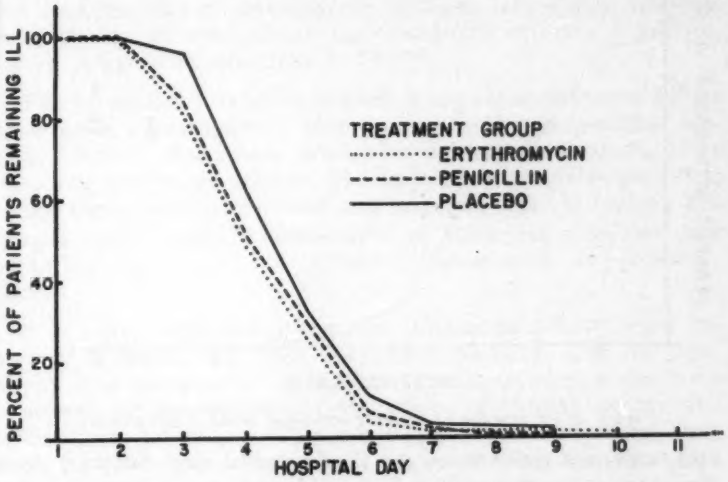

Figure 3. Duration of illness.

number of positive cultures, approaching zero within seven days. At the follow-ups, however, there is no essential difference between the three treatment groups as regards the number of positive cultures.

When the data were separately analyzed for the eradication of the streptococci *not* associated with clinical infection, the numbers in each group became so small that no valid comparison could be made. The effect on streptococci of the antibiotics and placebos given for nonbacterial respiratory infections cannot be assessed from this study.

Untoward Reactions to Therapy. The incidence of toxic reactions to any of the agents used in this study was extremely low. Only four patients showed any signs of reactions attributable to the treatment given. One patient receiving erythromycin complained of flatulence, and loose, bulky stools while on therapy;

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another patient complained of similar symptoms developing the day after discharge from the infirmary, and lasting only one day. One patient receiving penicillin intramuscularly developed a

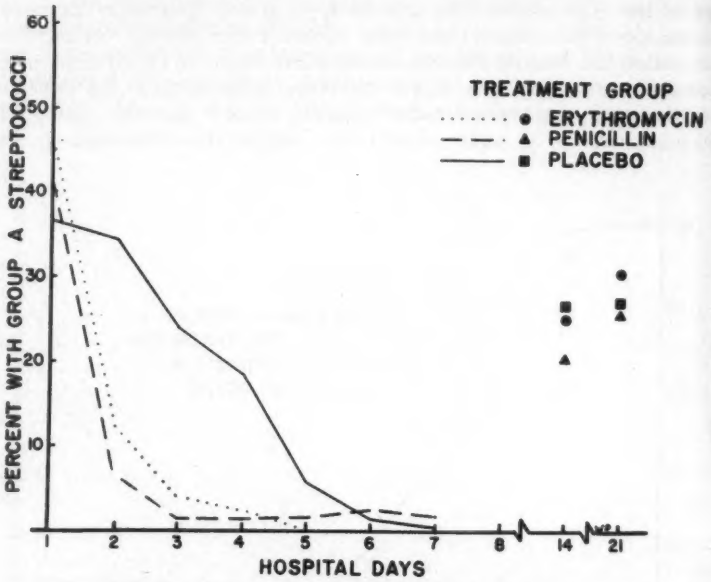

Figure 4. Percentage of patients harboring group A streptococci.

mild, transient urticaria on the third hospital day. Another, given the placebo preparation, had a mild rash on the second day, which subsided without specific therapy.

DISCUSSION

As each newly discovered antibiotic becomes more generally available, the increase in production and use makes the initially prohibitive cost decrease to the point that the antibiotic frequently becomes prescribed for nonspecific indications. With the possible exception of penicillin, it may safely be said that none of the antibiotics are yet so inexpensive that they may be indiscriminately used and abused. Apart from these purely economic reasons for the specific use of an antibiotic, there are many others of importance that should be considered by the physician who dispenses them so freely in this age of miracle drugs. Not the least among these reasons is the now considerable evidence of increasing resistance of many bacteria to many antibiotics.[23,24]

Particularly in the acute respiratory infections of unknown cause, the physician, often at the specific request of the patient, has tended to abuse the antibiotics. Even the slightest mention in the medical literature of potential benefits has been reason sufficient to warrant a therapeutic trial of an expensive medication. To date there has been little convincing evidence that any of the antibiotics alter the course of any of the viral or related acute nonbacterial respiratory infections.[7-15] The present study was undertaken to determine the exact status of erythromycin in this regard, believing that only a well-controlled and carefully documented observation would establish the value, or the lack thereof, of erythromycin in these infections. Adequate data are already available on the therapeutic efficacy of erythromycin in bacterial infections.[21, 22, 25-29]

The populations included in each of the three treatment groups were quite comparable as judged on many bases: medical history, clinical diagnoses, admission laboratory findings, mean age, and geographic origins. The majority of the infections from which these recruits suffered was probably viral in nature. The groups would appear to have been of sufficient size and comparability to warrant the detailed comparisons as presented above.

It is worth emphasizing that the therapeutic results were analyzed separately for each diagnostic category, and, for simplicity and because of the identical analyses, the results were combined for presentation of the effect of therapy on the 189 nonbacterial infections. This similarity is not surprising, however, because these diseases, if not causatively the same, are at least similar, and it was shown that the differential diagnosis is nearly impossible on the basis of the presenting clinical features.

The persistence of the specific symptoms and signs associated with the infection was also not affected by the treatment regimen. This is not a new finding, either, and a critical review of the data of others demonstrates that the duration of local symptoms, for example, even in streptococcal infections, may be identical in those patients receiving either antibiotics or placebos.[30] Perhaps the local tissue inflammatory response, once established, requires a certain minimum time for recovery, whether organisms remain present or not.

From the group of 189 patients with nonbacterial infections it may be concluded that the administration of erythromycin, penicillin, or a placebo to these patients did not alter the course of their respiratory infection when measured by the duration of fever, duration of leukocytosis, and the total duration of the

illness. It is possible, of course, that replicate experiments of this type might indicate that duration of fever and illness for a placebo group would always be slightly longer, as seen in figures 1 and 3, in which case some small advantage might be attributed to antibiotic therapy of the infection. The present observations do not support such a contention, however. When compared with earlier information on the use of penicillin, aureomycin hydrochloride, or oxytetracycline (terramycin) in similar infections,[7-15] it is fair to conclude that these observations are the replication of the previous ones, with the addition of data concerning erythromycin.

The sole advantage that may be attributed to antibiotic therapy is the effect on cultures for group A streptococci. As has been pointed out previously[21,22] the use of either erythromycin or penicillin in sufficient dosage for adequate periods is successful in eradicating the streptococcus from cultures of patients with these infections. Continuation of therapy beyond three days is required only for "bacteriologic cure," which naturally decreases the likelihood of a relapse, with reappearance of symptoms, complications, or sequelae. The significantly high number of positive cultures in all groups at the convalescent follow-ups would indicate that four to six days of erythromycin or penicillin therapy, employing the dosages used in this study, do little more than a placebo in maintaining patients consistently free of streptococci, an observation in agreement with the previous studies.[21,22] The behavior of the placebo group as seen in figure 4 is a little surprising when compared with the earlier observations, but it is likely that the numbers in the present groups are too small for such detailed comparisons.

The incidence of untoward reactions to the antibiotics and to the placebo tablets was remarkably low. Although antibiotic therapy would not be indicated in most of these infections, still the present study of a large number of patients offers further proof on the relatively low toxicity of these agents. Either antibiotic may be used with impunity in the specific treatment of most patients with bacterial infections.

These present observations are generally in accord with those of others [7-15,31] who have studied the place of antibiotics in the treatment of viral and related infections.

SUMMARY AND CONCLUSIONS

To determine what effects erythromycin has on the course of respiratory infections, a study of 265 male naval recruits with acute respiratory infections was made. Each patient was initially entered in strict rotation into one of three treatment regimens: erythromycin, penicillin, or a placebo. Detailed clinical, bac-

teriologic, virologic, and serologic information was obtained on each patient. Final diagnoses were established on the basis of all available information, and it was determined that the majority of the patients were suffering from viral or related nonbacterial respiratory infections of unknown cause. The populations in each treatment group were shown to be comparable on many scores.

Separate analyses of the therapeutic effects of the three regimens were made for each diagnostic category. The generally beneficial effects of erythromycin and penicillin in streptococcal infections were similar to previous observations. In the nonbacterial respiratory infections, detailed observations were reported on the clinical effects, the duration of fever, the duration of leukocytosis, the duration of the illness, and untoward reactions to the agents given. The administration of either of the antibiotics, when compared with the course in the placebo group, did not alter the course of the infection. In essence, then, it may be concluded that erythromycin and penicillin were specifically indicated for treatment of the streptococcal infections only. No secondary complications were encountered in any group.

It appears that the routine use of erythromycin or penicillin in the treatment of viral or related nonbacterial respiratory infections is of little or no value in affecting the acute infection, and for economic and medical reasons should be avoided.

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HIGH VELOCITY MISSILE WOUNDS

With Particular Reference to the Head

ELDRIDGE CAMPBELL, *M. D.*

IN war the most important function of the surgeon is the treatment and care of the wounded. Today, however, all civilized peoples are surfeited with war; service in the armed forces is sometimes considered an inescapable duty rather than a privilege. By contrast, all about us are exciting new developments in what we think of as "civilian surgery": the cure of aneurysms of the circle of Willis and of the aorta, new operations for the control of pain, new concepts of the roles of the adrenal and the pituitary glands in surgical convalescence, and many more. Let us not forget, however, that military surgery often has been in the past, and can yet be, a most fertile and useful field of study. What we learn of the body's reaction to injury may be applied to all forms of surgery; the biology of wound healing is fundamental to all operations. As Henri de Mondeville so clearly perceived and stated more than 600 years ago: "Nature is a fiddle player to whose tunes the surgeon must learn to dance."

Wounds may be considered from two standpoints: (1) the local lesion and (2) the pathophysiologic changes attendant thereto. Such a division is largely a matter of convenience, because the two are interdependent. The following discussion will be limited to a few of the mechanical aspects of wounding by missiles.

For many years both hunters and military surgeons have been intrigued by certain aspects of the high-powered rifle bullet wound. The aperture of entrance is often small, while that of exit is relatively large; tissue damage along the path is proportionately even greater; air may be found within the wound, requiring differentiation from gas due to anaerobic bacteria; and, most puzzling of all, structures not directly in the path of the missile, such as arteries, nerves, or even bone, may be injured.

All these features have been observed in head wounds. In the brain one may observe along the track of the missile a zone of pulping and hemorrhage, normal tissue well beyond, and, in be-

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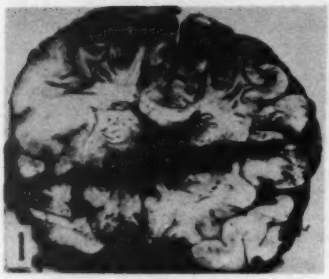

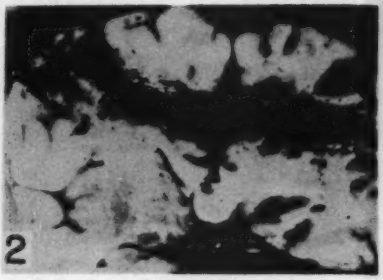

Figure 1. Perforating wound. Survival time, 30 minutes. Figure 2. Perforating wound. Survival time, 13 hours. (Reproduced with permission[3])

tween, the very significant area, referred to by Rand[1] and Rand and Courville[3] as the "zone of delayed disintegration" (figs. 1-3).

Three types of fracture are encountered in the skull: (1) the very common penetrating (or blow-in) fracture with depressed or

Figure 3. Penetrating wound. Survival time, 31 hours. Note the widening zone of "delayed disintegration." (Reproduced with permission[3])

indriven fragments; (2) the linear fracture usually emanating from the former openings; and (3) a curious type of fracture which is largely confined to the base, which is not continuous with wounds of entrance or exit, and which Campbell and Kuhlenbeck[3] termed "discontinuous" fractures (fig. 4).

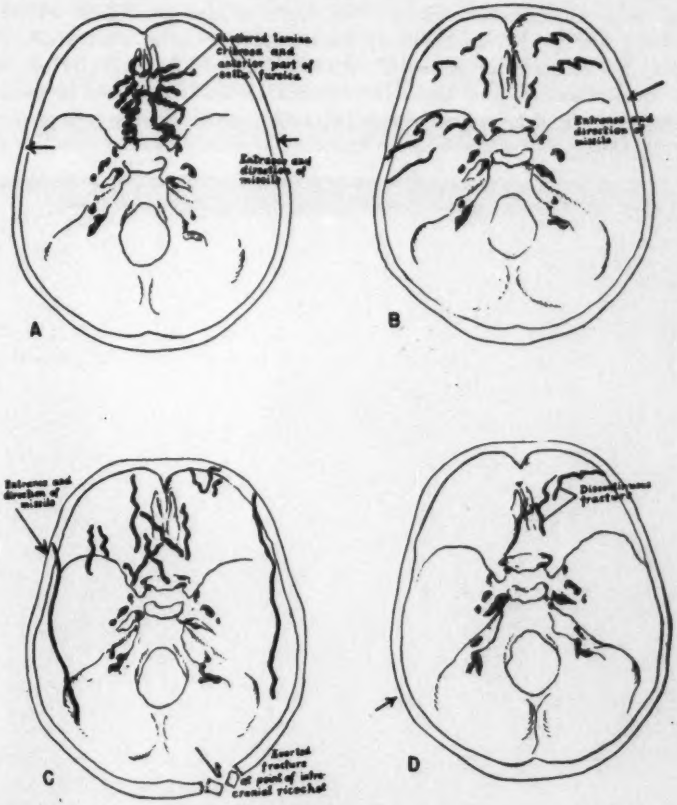

Figure 4. "Discontinuous" fractures in base of skull, as drawn at autopsy. (Reproduced with permission[3])

In this connection the following extract from the autopsy record of President Lincoln is a pertinent illustration of a "discontinuous" fracture.

There was a gunshot wound of the head around which the scalp was greatly thickened by haemorrhage into its tissues. The ball entered through the occipital bone about an inch to the left of the median line and just above the left lateral sinus which is opened. It then penetrated the dura mater, passed through the left lateral ventricle and

lodged in the white matter of the cerebrum just above the anterior portion of the left corpus striatum where it was found. The wound in the occipital bone was quite smooth, circular in shape with beveled edges, the opening through the internal table being larger than that through the external table. The track of the ball was full of clotted blood and contained several little fragments of bone with a small piece of the ball near its external orifice. The brain around the track was pultaceous and livid from capillary haemorrhage into its substance. The ventricles of the brain were full of clotted blood. A thick clot beneath the dura mater coated the right cerebral lobe. There was a smaller clot under the dura mater of the left side. But little blood was found at the base of the brain. *Both the orbital plates of the frontal bone*

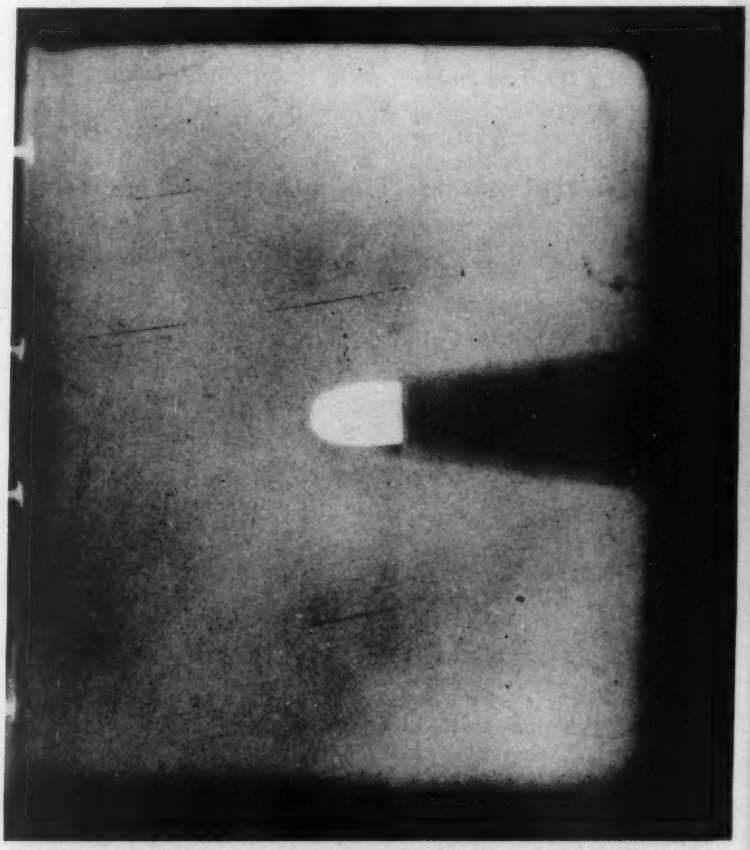

Figure 5. Microsecond roentgenogram showing cavity forming behind nose of .45-caliber pistol bullet. Gelatin tissue model. (Courtesy of Chemical Corps Medical Laboratories, Army Chemical Center, Md.)

were fractured and the fragments pushed up towards the brain. The dura mater over these fractures was uninjured. [italics mine] The orbits were gorged with blood.[4]

WOUND BALLISTICS

In order to comprehend either the gross or the microscopic changes in wounded tissues, a knowledge of wound ballistics is essential. One must study not only the behavior of the missile in tissues of various densities and strengths, but also the types of displacement, shearing, and distraction which may result.

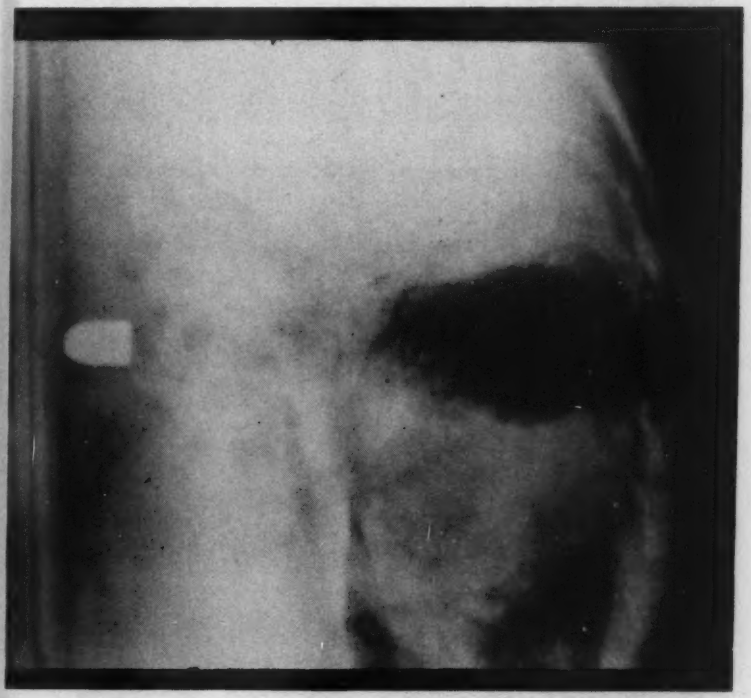

Figure 6. Microsecond roentgenogram showing .45-caliber bullet passing through heart and lungs of a dead animal. Lungs suffused with lipiodol to increase contrast. Note the large cavity in the heart and the smaller cavity in the less dense lungs. (Courtesy of Chemical Corps Medical Laboratories, Army Chemical Center, Md.)

In recent years the development of spectrophotography has made it possible to make roentgenograms of missiles with about one millionth of a second (microsecond) exposure time at the rate of 8,000 per second. Thus one is able to follow a high velocity missile in its flight through living tissues. A number of such studies have been made, one of the most important being

that of Harvey[5] and his associates. Missiles in flight with velocities of from 800 to 900 ft./sec., corresponding to the .45-caliber revolver; of from 1,100 to 1,400, corresponding to the .22-caliber long rifle; of 2,800 ft./sec., corresponding to the M-1 rifle; and others up to 5,000 ft./sec., as are encountered in some heavy bomb fragments, have been observed by this method.

The rather startling revelations concerning the local mechanical changes in traversed tissues, as illustrated below, can best be understood if one bears in mind the formula: $F = \frac{1}{2} M V^2$, where F is the force expended, M is mass, and V the velocity. Thus

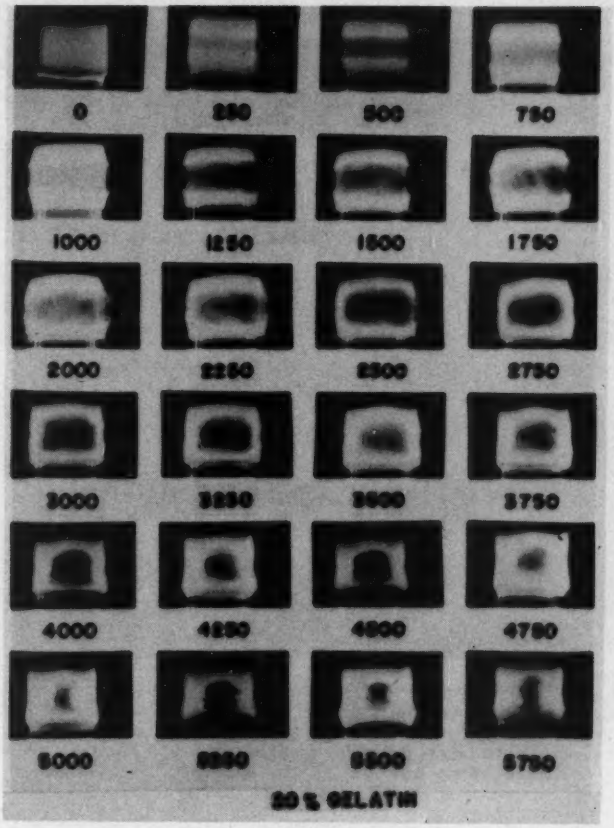

Figure 7. Series of microsecond roentgenograms showing wound cavitation in a gelatin model following passage of a .30-caliber bullet. The number beneath each figure represents the time in millionths of a second following impact. Note the growth and collapse or "pulsation" of the cavity. (Courtesy of Chemical Corps Medical Laboratories, Army Chemical Center, Md.)

the wounding force is directly proportional to the mass of the missile, but to the *square* of its velocity.

A slowly moving object, such as a nearly spent bullet or a bayonet destroys tissue in its immediate path and pushes those adjacent thereto aside without great damage. Not so with missiles of high velocity. Here one sees evidence of tissues thrust aside with such astonishing violence as to produce an actual cavity.

Figure 8. Microsecond roentgenogram showing wound cavitation in goat's leg following passage of .30-caliber bullet. (Courtesy of Chemical Corps Medical Laboratories, Army Chemical Center, Md.)

With increasing velocities these cavities become larger, recalling again the fact that force is proportional to the square of the velocity.

Figure 5 shows the formation of the cavity in a gelatin block behind a .45-caliber bullet. Even at this relatively low speed (850 ft./sec.), the cavity is much wider than the missile. Figure 6 shows the cavity produced by a similar missile traversing a

dog's thorax. The cavity in the heart is much larger than that in the relatively less dense lung. Rapid variation in size and shape of a cavity ("pulsation") may be conveniently examined in a series of spectrophotographs (fig. 7) caused by a .30-caliber bullet (traveling with a velocity of about 2,800 ft./sec.) in a gelatin block. The cavity is almost collapsed within about .006 second. The closure of the apertures of entrance and of exit prior to the collapse of the cavity accounts for the trapping of air within wounds. As the velocity is increased, the size of the cavity, and hence the cross sectional area of tissue destruction, mounts rapidly. Figure 8 shows the wake of a .30-caliber bullet in a goat's thigh. Thus the stretching and tearing of blood vessels and nerves at a distance from the actual path of the missile

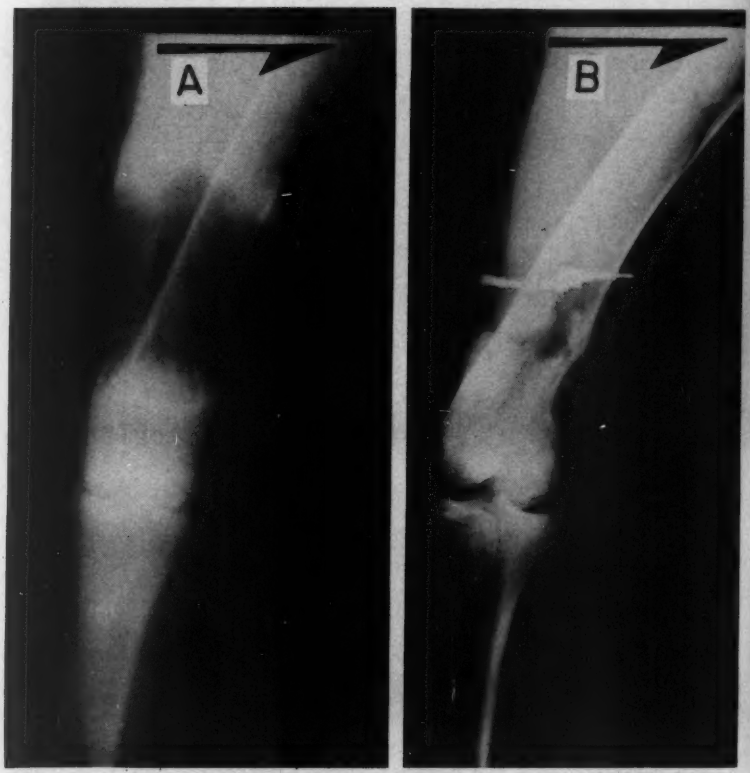

Figure 9. Microsecond roentgenograms of goat's leg struck by a .30-caliber rifle bullet, contrasting maximum size of wound cavity (A) with residual cavity (B). The cavity in B has been outlined with lipiodol. Note the comminuted fracture of the femur which has taken place despite the fact that the bullet did not touch the bone. (Courtesy of Chemical Corps Medical Laboratories, Army Chemical Center, Md.)

Figure 10. Microsecond roentgenogram showing wound cavity created by a .22-caliber, long-rifle, soft-nosed bullet. Although this missile was lighter and slower than those shown in figures 8 and 9, the temporary wound cavities are about equal, thus demonstrating the increase in wounding as the result of mushrooming and fragmenting. (Courtesy of Chemical Corps Medical Laboratories, Army Chemical Center, Md.)

become understandable. In figure 9 (A and B) may be seen, first, the huge cavity immediately following the passage of a 2,800-ft./sec. bullet; and, second, the extensive comminution of the femur which resulted despite the fact that it was not touched by the missile. The relatively small permanent cavity is outlined with lipiodol, whereas the area of tissue destruction extends over a far wider zone.

Additional factors of practical importance referable to the missile are fragmentation, tumbling, and yawing. A soft missile, such as one of lead, often mushrooms and/or breaks into a number of separate particles, each of which creates a path of destruction of its own. This is particularly true within the skull, where in-

driven bone fragments also leave wakes of destruction. Figure 10 reveals a huge cavity formed by a .22-caliber, long-rifle bullet. Though its velocity was less than that in figures 8 and 9, damage was greatly augmented by fragmentation. The frightful effect of the dum-dum or soft-nosed bullet is thus evident. (This also explains the fact that both in the Franco-Prussian War and our Civil War, there were accusations concerning the use of "explosive" missiles.) When a bullet begins to "tumble," that is

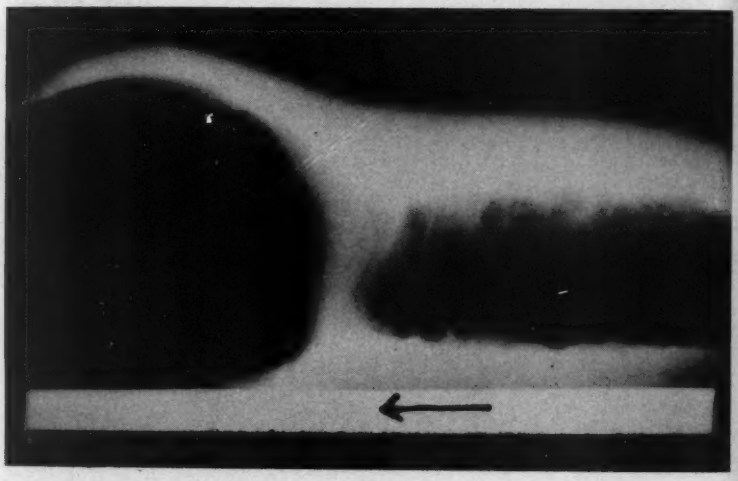

Figure 11. Microsecond roentgenogram illustrating increased wounding resulting from bullet upset or tumbling. Arrow marks point of the missile's altered behavior. (Courtesy of Chemical Corps Medical Laboratories, Army Chemical Center, Md.)

to turn end over end in addition to spinning, the resultant increase in tissue destruction in considerable. In figure 11 the effect of this may be seen in a gelatin block.

Density and displaceability of the wounded tissue are physical factors of considerable importance. The relatively small size of the cavity produced in lung tissue (filled with compressible gas) is illustrated in figure 6. The same effect may be demonstrated in the classic experiment of firing into a brain-filled skull or a water-filled metal can, as contrasted with the empty skull (fig. 12) or the empty can.

MECHANISM OF FRACTURE PRODUCTION

The mechanisms of the productions of the indriven and radiating fractures are readily understood on the basis of local deformity of the hard but semielastic skull by the missile. It was well known to such ancient surgeons as Hippocrates and Theo-

doric that, in glancing blows, the maximum or only depression may be confined to a displaced fragment of the inner table.

The mechanism of the production of the "discontinuous" fracture is unknown. The most plausible explanation, however, is

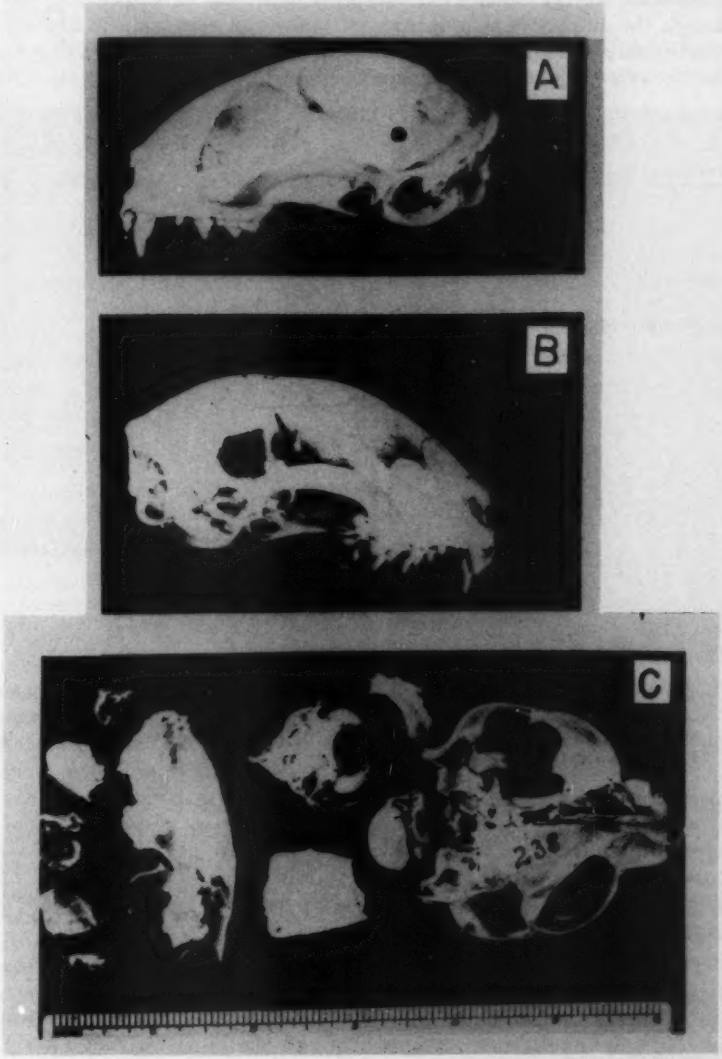

Figure 12. Relative effects of a missile on the skull of a cat, with and without removal of the brain before the shot. (Reproduced with permission[5])

based on the concept of waves of deformity in the skull, so clearly demonstrated by the "stresscoat" studies of Gurdjian and his co-workers.[6-9]

It has been postulated by others, however, that this represents a bursting injury comparable to that depicted in figure 12. Although the intracranial pressure is doubtless enormous at the instant of missile penetration and squeezing or thrusting injuries at the foramen magnum or incisura might be expected to result,

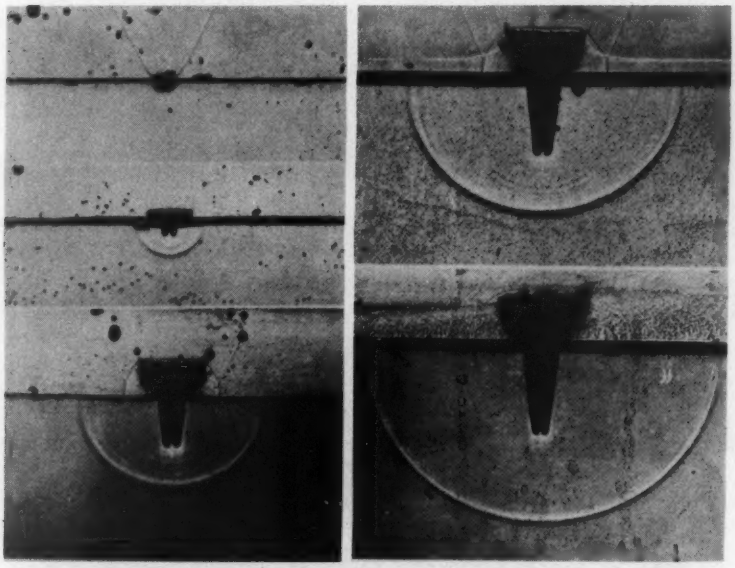

Figure 13. Spark shadowgraphs of a 4/32-inch sphere taken at successively longer intervals after it has hit the surface of water. Note compression waves preceding missile at the velocity of sound in water, 4,800 ft./sec. (Reproduced with permission[5])

these have not been commonly observed. Furthermore, an explosive force from within the skull would be expected to thrust comminuted fragments outward. That this is not uniformly the case is attested by the autopsy record of President Lincoln, in which the orbital plates were clearly recorded as having been "pushed up towards the brain."

Pressure changes within the cranium at the instant of wounding must, nevertheless, be very great. These come about as the result of three separate and distinct factors: the concussion waves, the deformity of the skull, and the missile-tract cavity. All exert their effects within a few thousandths of the first second and probably, to some extent, overlap.

Harvey[9] and his associates found that shock waves were generated at the point of the bullet's impact, and that they passed through tissues at the rate of sound through water (about 4,800 ft./sec.) (fig. 13). They displace brain tissue very little where it is not in contact with gas, and are probably not of themselves highly injurious.

The changes in intracranial pressure at various points within the skull at the time of fracture have been recorded by Gurdjian:[10]

> * * * pressures of the order of 2,500 to 5,000 mm. of mercury or 50 to 100 pounds per square inch are recorded in association with concussive effects. Later work has shown that the shorter the duration of energy the less the clinical effect. * * * Twenty-two pounds per square inch will cause a fatal concussion if the pressure lasts in the neighborhood of 1/30 of a second, but 60 pounds per square inch lasting 1/1000 of a second will cause minimal concussive effect with a short period of apnea and very slight increase in blood pressure. It appears, therefore, that the time duration of the sudden rise in intracranial pressure either from a deformation of the skull or an acceleration of the head or a combination of both is the cause of the clinical effects of concussion * * *.

INTRACRANIAL PRESSURE CHANGES

The pressure elevation associated with the formation of missile cavities must be enormous, particularly in perforating wounds. Exact figures are not available for publication.

How does the brain tolerate these tremendous pressure changes? Why not a fatality in every fracture or missile wound? The answer must be that the brain can tolerate far higher pressures than formerly believed possible—*provided* they are of very brief duration, and provided also that they are not associated with extensive missile-path destruction and shearing. If the skull were as elastic as the skin, each severe wound would probably cause such distortion as to prove instantly fatal.

Evans and his co-workers[11] at Cincinnati and we at the Albany Medical College have often recorded cerebrospinal fluid pressures which mounted to 800 or 1,000 mm. of water during induction of anesthesia, without evidence of permanent ill effects. It is the belief of Evans that from the clinical standpoint displacement and distortion are of more importance than pressure *per se*. Incidentally, it is worth recalling that peripheral nerves can function under very high pressures—provided no distortion is present. Mitchell[12] observed that the rabbit's sciatic nerve could conduct impulses for as long as two minutes when subjected to pressures up to 50.8 cm. of mercury. This work was subsequently confirmed and amplified by Denny-Brown and

Brenner.[13] Grundfest[14] actually demonstrated that frog nerve would conduct when subjected to pressures up to 1,000 atmospheres, provided the oil in the pressure chamber was oxygenated.

A study of the intracerebral missile tracts is of major importance to the surgeon. Each may conveniently be considered in three parts: the zone of pulping and blood clots, the "zone of delayed disintegration," and the surrounding normal brain tissue. The path of pulping from the primary (and, to a certain extent, from secondary) missiles is wider than the moving fragment itself. The speed, tumbling, and yawing of the missile, as well as the number, type, and size of wounded blood vessels are the principal determining factors. Because of the elasticity of the skin, wounds of entrance and exit are proportionately smaller.

The "zone of delayed disintegration" includes neighboring nerve tissue which has been mortally injured by compression, distortion, and shearing, but which has not been pulped. When seen within the first hours, its macroscopic differentiation is difficult, but as time goes on a softening of its texture and a gray-brown appearance serves to delineate it. Thus in figures 1, 2, and 3 the relative width of delayed softening can, in rough measure, be demonstrated about missile tracts of 30 minute- (fig. 1), 13 hour- (fig. 2), and 31-hour duration (fig. 3).

In the strictest sense, it is obviously impossible at the time of operative débridement to remove all of the pulped tissue, much less all of the "zone of delayed disintegration." However, it is likely that the earlier the pulped tissue and blood clot are removed, and also indriven bone fragments and any missiles which can be reached safely and conveniently, the less will be the local and distant effects of pressure, the more tissue in the areas of reversible damage will recover, and the earlier will correctable disturbances of function be favorably altered.

SUMMARY AND CONCLUSIONS

Energy released in tissues by a high velocity missile results in mechanical alterations of two main types. Shock waves which precede the missile result in little distortion and are believed to do little harm. The cavity which follows, however, results in great distortions, stretchings, and shearings, many of which occur at a considerable distance from the actual missile tract.

In planning the débridement of such a wound, whether it be in the head or elsewhere, it thus becomes evident that adequate exposure will usually entail a far more generous incision than the size of the wound of entrace or of exit might suggest.

Studies of the pressure changes during the various phases of the formation of these cavities would appear highly desirable.

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THE ONE INDISPENSABLE ELEMENT

I fear that in the presence of the machines and the amazing devices which science has developed to extend the capabilities of men, we sometimes overlook the fact that man himself is the one indispensable element of victory in war. It is the ground soldier who must seize and hold the terrain necessary for victory. There is a particular pride that comes from service in our ground forces, service that demands the highest quality of personal leadership, the maximum of individual know-how, and the greatest courage. In this age, as in all ages, the power of decision remains in the hands of men who can live and fight under the most adverse conditions, tough combat soldiers who can come to grips with the enemy and exercise direct and effective compulsion upon him.

—HONORABLE ROBERT T. STEVENS,
Secretary of the Army
in an address at Commencement Exercises,
United States Military Academy, 8 June 1954

TREATMENT OF BACTERIAL INFECTIONS OF THE SKIN WITH ERYTHROMYCIN-NEOMYCIN OINTMENT

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CUTANEOUS diseases constitute a major cause of hospitalization and noneffectiveness in the U. S. Air Force.[1] Latest statistical data (1951) shows that dermatological conditions (excluding dermatophytosis) were the fourth leading cause of time lost from duty, and third highest as the cause of hospital admission. These data showed that pyogenic infections of the skin constitute from 30 to 40 percent of all skin diseases treated in military hospitals.

The misapplication of antibiotics and other measures used to treat infections has been contributory to this situation. This is not meant as an indictment of conscientious and well-meaning medical officers. As Kierland[2] pointed out, this is rather an indictment of lack of dermatological training in medical schools throughout the United States; lack of sufficient provisions for training the general military medical officer in dermatology; and a general military medical unawareness of the seriousness of dermatological conditions as a cause of noneffectiveness. Regardless of reasons, the dermatologist's contribution to lowering noneffective rates is not granted the military medical recognition to which it is entitled. Provisions for dermatological facilities are rarely made when new hospital construction is contemplated. In many instances, the military dermatologist is charged with the care of patients with gonorrhea, while those with acne, pyogenic infections of the skin, cutaneous cancer, hemangiomas, atopic dermatitis, and other cutaneous diseases are often handled unwisely by specialists in other fields and general medical officers. The correction of these conditions should become a matter of education, starting in medical schools and continuing through the career of our military personnel.

Because of the alarming statistics on causes of noneffectiveness, as mentioned above, and the high rate of pyogenic infec-

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tions of the skin, we thought it appropriate to review and present our concepts of recent advances in the treatment of such conditions, as applied to military dermatological problems. As we had just completed a study of the effectiveness of a combination of erythromycin and neomycin in the treatment of bacterial infections of the skin, these results will also be given.

ANTIBIOTICS AND THEIR EFFECTIVENESS

In the past few years, many antibiotics for oral, parenteral, and topical use have become available for the treatment of bacterial infections. Most have been adopted for use by the average physician on a trial basis with the thought that if this one doesn't work the next new one will. This attitude has stimulated the major biological houses and research workers to search for antibiotics with broader spectra. To date, no single antibiotic has a broad enough spectrum to be effective against all bacteria. It has been shown by Livingood and associates[3] and Kile and coworkers[4] that neomycin has the broadest spectrum of any other single antibiotic and is more effective in treating most skin infections than any other topical agent. Neomycin is derived from strain of *Streptomyces fradiae*. It has a low sensitizing index, and is extremely soluble and stable in solution. This characteristic makes it ideal for use as a compress as well as in ointment form. However, neomycin is inferior to aureomycin and oxytetracycline (terramycin) when used for hemolytic streptococcic infections. Table 1 is adapted from one first published by Livingood and Mullins[5] and includes additional findings relative to erythromycin by Haight and Finland[6] to show the relative in vitro and in vivo effectiveness of the various available antibiotics recommended for the local treatment of bacterial infections of the skin. It can be seen that neomycin has the broadest spectrum except for its action against hemolytic streptococci.

More recently, combinations of single antibiotics have been developed in an effort to broaden the spectrum of one or the other. With the discovery of erythromycin, derived from *Streptomyces erythreus*, we had available an antibiotic with major activity against all gram-positive cocci. Haight and Finland showed that erythromycin is most active against gram-positive cocci as well as strains of neisseria, diphtheria bacilli, and hemophilus but relatively inactive against most coli and enteric bacilli. They found that the most sensitive organisms were pneumococci and group A hemolytic streptococci. This activity made it theoretically ideal for combination with neomycin. The results of the clinical effectiveness of this combination will be shown later.

One may ask why penicillin has been more or less ignored in the modern treatment of pyogenic skin infections. We believe that most bacterial infections of the skin can be favorably in-

TABLE 1. *Antibacterial spectrum of antibiotics recommended for local treatment*

Antibiotic	Hemolytic staphylococcic (coagulase-positive)	Hemolytic streptococcic	Proteus	Pseudomonas	Other gram-negative bacilli
Aureomycin*	+++	+++	0 (?)	0 (?)	++
Bacitracin*	++	+++	0	0	0
Neomycin*	++++	++	+++	+++	+++
Polymixin B*	0	0	+	++++	?
Oxytetracycline*	+++	+++	0 (?)	++	+++
Erythromycin**	+++	++++	0 (?)	0 (?)	0 (?)

*Livingood and Mullins[6]
**Haight and Finland[7]

++++ = Superior
+++ = Excellent
++ = Satisfactory to excellent
+ = Inferior
0 = No effect

fluenced by proper local treatment in about the same time as required for penicillin when used parenterally. In addition, penicillin is inactive against the gram-negative organisms, including pseudomonas, proteus, and others. We believe, however, that penicillin is the antibiotic of choice for parenteral administration and should be used along with proper local treatment in fulminating infections with lymphangitis as well as generalized infectious diseases. The danger of using penicillin locally will be outlined below.

The ideal antibiotic for local use should fit certain stringent criteria:

1. It should have a low allergenic and irritative index.

2. It should have a broad spectrum for both gram-positive and gram-negative organisms.

3. It should not promote the growth of *Candida albicans* (*Monilia albicans*) but, rather, contain a moniliostatic agent.

ALLERGENICITY

All drugs used on animals and human beings have the potentiality of sensitizing the patient or causing primary irritation. This factor contributes to about 10 percent of military causes of noneffectiveness. Antibiotics and other drugs used to treat skin conditions vary widely in their sensitizing potentials. In our experience, the following drugs, especially when used for long periods, are apt to sensitize or irritate the patient:

Nitrofuran compounds. The allergic contact dermatitis caused by these drugs is of a particularly severe and resistant nature. We have seen contact dermatitis occur with these drugs in as short a period as 20 days. We believe that the use of these drugs for their antibacterial properties is unjustified because of their low bactericidal properties, as compared to the relatively "safe" antibiotic ointments that are available.

Mercury compounds. Mercury produces sensitivity in upward of five percent of patients. Hu and associates[7] have shown in their work on tissue cultures that drugs causing irritation in low concentration are more apt to sensitize than bland preparations.

When used locally, *sulfonamide compounds, penicillin ointment,* and *streptomycin* (not made in ointment form by any commercial companies) are apt to sensitize as well as produce other undesirable effects. Ointments containing sulfonamide compounds, for example, may cause a decrease of the "light" threshold of the patient with severe sunburn or other photodermatoses; if exposed to roentgen rays or ultraviolet while they are using it.

Antihistamines. Antihistaminic ointments produce allergic reactions in certain instances. The relationship of antihistamines to local anesthetics follows their potentiality in producing allergic reactions. Such drugs used in ointment form are apt to sensitize. We do not imply that these preparations should never be used, but care should be exercised when used on an inflamed or otherwise broken skin.

It is apparent that a great number of the above-mentioned preparations are used on dermatological patients by the general medical officer. Often he is not aware of the development of sensitivity as reflected by an exacerbation of the lesion or failure to get well. Withdrawal of the offending drug may result in recovery of the patient. Caution in the use of these drugs will surely be followed by a decrease in the noneffectiveness of patients with dermatological conditions. All the antibiotics listed in table 1 can be used with assurance of their low allergenicity. Occasionally a patient may develop sensitivity to one or the other of these preparations (the antibiotic or the ointment base) but its occurrence will be rare.

BROADNESS OF SPECTRUM

Table 1 shows the variation in effectiveness of the various antibiotics for the bacteria responsible for most pyogenic infections of the skin. Theoretically, an antibiotic or combination of antibiotics effective against all bacteria would enable us to treat pyogenic skin infections successfully without determining the organism or organisms causing the infection. Unfortunately, facilities for accurate determination of offending organisms are not possible at most of our military hospitals. Moreover, if we have an antibiotic with a particularly broad spectrum for both gram-positive and gram-negative organisms, our necessity for culturing is decreased in most instances. Of the antibiotics listed in table 1, neomycin shows the broadest spectrum with "excellent" activity against hemolytic staphylococcus (found in over 65 percent of pyogenic skin infections),[5] satisfactory to excellent activity against hemolytic streptococcus, and excellent activity against the gram-negative organisms. Its only deficiency (and that is slight) is its low activity against hemolytic streptococci as compared to aureomycin, oxytetracycline, and bacitracin. However, these latter drugs are less effective against the gram-negative organisms and hemolytic staphylococci when compared with neomycin.

MONILIALSTASIS

The widespread use of the antibiotic ointments brought reports of moniliasis developing as a complication.[3,5] This complication is manifested by an increase in redness and irritation

of the treated part as well as development of a frank moniliasis which often proved as stubborn as the original infection. Moniliasis is most apt to develop in the genitocrural areas and other intertriginous sites, but it has been observed elsewhere. Although the production of moniliasis from the use of antibiotic ointments is rare, efforts have been made by pharmaceutical companies to reduce this risk still further by the use of the parabens incorporated into the ointment bases. Methyl p-Hydroxybenzoate (methylparaben) is moniliostatic and does not interfere with the action of the drug. Although moniliasis is a complication of local antibiotic therapy, it is mentioned only to create awareness of the possibility. This occasional occurrence in no way contraindicates the use of such antibiotic ointments.

With the discovery of erythromycin, immediate consideration was given to its possible use in combination with another antibiotic. Neomycin was considered the best single antibiotic available, except for its relative deficiency against hemolytic streptococci. The high activity of erythromycin against hemolytic streptococci (table 1) would theoretically make it ideal for combination with neomycin. This combination (erythromycin-neomycin ointment), supplied to us by the manufacturer in sufficient quantities to conduct a large clinical trial, contained 5 mg. per 1 gram of erythromycin and neomycin in a suitable base.

PROCEDURE

The use of this combination was limited to certain primary and secondary pyogenic infections of the skin, as shown in the classification in table 2. At the time of the first visit, the diagnosis was made and the patient given a tube of the ointment. Patients were instructed to gently rub the ointment into the lesion for about 30 seconds, four times daily. In cases of impetigo contagiosa, the instructions also included removal of the crusts before application of the ointment. Patients were instructed to return at weekly intervals for evaluation and change of treatment if necessary. It should be noted that standard methods of management, with soaks and compresses, were not generally prescribed. This procedure is unnecessary in most cases and should be reserved for those patients with excessive weeping or to remove crusts to allow the antibiotic to contact the part. A total of 141 patients were treated with erythromycin-neomycin ointment. Results of this treatment are shown in table 2.

RESULTS

Of 92 patients suffering from one of the primary bacterial diseases of the skin, 81 were cured and 11 were improved. No patient remained the same or became worse. The results in patients having pyogenic skin disease secondary to other diseases was not

TABLE 2. *Results of treatment of pyogenic skin infections with erythromycin-neomycin ointment*

Type of infection		Number of patients	Cured	Improved	Unimproved
Primary	Secondary				
Impetigo contagiosa		28	26	2	0
Impetiginous dermatitis		28	26	2	0
Sycosis vulgaris		17	14	3	0
Pustular folliculitis		14	10	4	0
Otitis externa		3	3	0	0
Furunculosis		2	2	0	0
Total		92	81	11	0
	Contact dermatitis	16	10	4	2
	Eczematous dermatitis	9	8	1	0
	Seborrheic dermatitis	6	5	1	0
	Surgical procedures	4	4	0	0
	Burns	2	2	0	0
	Insect bites	2	2	0	0
	Intertrigo	2	2	0	0
	Dermatophytosis	2	2	0	0
	Nummular eczema	2	0	0	2
	Dermatitis repens	1	0	0	1
	Insect granuloma	1	0	1	0
	Atopic dermatitis	2	1	0	1
Total		49	36	7	6
Grand total		141	117	18	6

as good, with 36 of 49 being cured, 7 improved and 6 remaining the same or becoming worse under treatment. It can be seen (from a study of table 2) that best results were obtained in the treatment of impetigo contagiosa and impetiginous dermatitis. We were favorably impressed, also, with the results of treatment of sycosis vulgaris. However, most of these were the superficial rather than the deep, boggy resistant type.

TABLE 3. *Average time to "cure" cutaneous bacterial infections with erythromycin-neomycin ointment*

Infection	Number of patients "cured"	Average number of days required
Secondary pyogenic infections	36	7.64
Impetigo contagiosa	26	5.58
Impetiginous dermatitis	26	10.69
Sycosis vulgaris	14	19.71
Folliculitis	10	9.40
Otitis externa	3	8.66
Furunculosis	2	7.00

Table 3 shows the average time required to cure patients with pyogenic skin diseases. Patients with impetigo were cured in an average of 5.6 days, while those with sycosis vulgaris took an average of over 19 days. It has been our experience that the time required for cure in these conditions compares favorably with that when other antibiotics and other measures are used.

COMPLICATIONS

The unimproved patients were cases of pyogenic skin infections complicating other conditions. Three patients, with definite deleterious reactions to the application of erythromycin-neomycin ointment, are briefly reported.

Case 1. This patient, a foreign cadet, had a secondary infectious dermatitis of the groin following the injudicious use of podophyllum in the treatment of condyloma acuminatum. The infection cleared in about seven days, but the patient, because of the language difficulty, misunderstood instructions. He continued the use of the ointment we had prescribed for 21 days, and by that time he had developed severe moniliasis.

Case 2. This patient with folliculitis of the inguinal region developed increased weeping and irritation after using erythromycin-neomycin ointment for seven days.

Case 3. This patient was treated for a secondarily infected contact dermatitis of the penis. After using erythromycin-neomycin ointment for three days, he noticed increased irritation and inflammation.

It should be noted that these three patients all had involvement of the inguinal or genital region. Only the first case could be attributed to the development of moniliasis. The other two cases appeared to be of the intolerance type. In a series of 184 patients treated with erythromycin alone, Livingood and associates[4] reported exacerbations of skin lesions as a result of the antibiotic in three (1.6 percent). Although patch tests were not done in our series of 141 patients, only two (1.4 percent) exacerbations could be attributed to either the erythromycin or neomycin. The third patient (0.7 percent) developed moniliasis following continued application of the ointment.

DISCUSSION

The successful treatment of patients with pyogenic skin infections demands a recognition of the disease, the avoidance of preparations liable to sensitize or irritate, and the local application of broad-spectrum antibiotic ointments. It is our opinion that penicillin given parenterally is the antibiotic of choice in the event of systemic involvement. However, aureomycin and oxytetracycline may be used orally in such cases. From theoretical considerations, neomycin is probably the antibiotic of choice for the treatment of most pyogenic skin infections. Although the erythromycin-neomycin combination yielded excellent clinical results, its great superiority over neomycin alone was not apparent to us. The only possible criticism of erythromycin-neomycin ointment is the potentiality of erythromycin to produce irritative effects when used locally (1.4 percent in our series). The exact allergenic and irritative possibilities of this antibiotic must await further analysis.

SUMMARY AND CONCLUSIONS

Reduction of noneffectiveness of military personnel resulting from the pyogenic diseases of the skin can be accomplished by (1) early recognition of the disease process, (2) application of the proper antibiotic ointment, (3) avoidance of the use of irritating and allergenic substances, and (4) the judicious use of parenteral penicillin when indicated.

All medical officers on general duty should be indoctrinated in the recognition and proper management of common diseases of the skin.

We considered our results with erythromycin-neomycin ointment in the treatment of patients with primary skin infections ex-

cellent to superior; and in those with secondary skin infections, good to excellent.

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ON REASSURANCE

A great many doctors are so afraid that their own emotions may be aroused by their patients, either out of sympathy or dislike, or even amorousness, that they don't give them a chance to get a word in edgewise. They talk at and down to them to protect themselves and, as they think mistakenly, to save time. Before they know what to reassure them about they will begin to reassure them in a premature Pollyanna sort of way. A patient complaining of the symptoms of an ulcer may not be at all reassured when he is told that x-ray does not show any deformity of the duodenal cap. He may actually be galled by his domineering, aggressive wife or his unreasonable boss, and may want to talk about that. But the doctor's insistent and prompt reassurance may shut him up completely. Reassurance in the face of any considerable anxiety is at best a temporary and superficial expedient and needs, like digitalis in a failing heart, to be constantly repeated. The most reassuring thing is the quiet, firm integrity of the physician, his devotion to his job, and his scrupulous thoroughness.

—CARL BINGER, M. D.
in *Journal of the Medical Association of the State of Alabama*, p. 223, Mar. 1954

MORTALITY FACTORS IN ACUTE SMALL BOWEL OBSTRUCTION

JOHN A. BOLLINGER, *Captain, USAF (MC)*

ACUTE small bowel obstruction continues to be a serious problem but the mortality has decreased because of better diagnosis and improved management. Although antibiotics and electrolyte management have played an important role in this reduction, the greatest single factor probably has been the institution of intestinal decompression. In the presuction era, Scudder[1] and McIver[2] reported mortalities of 60 and 40 percent, respectively; while in 1939, just seven years after McIver's experiences were published, Wangensteen and associates[3] had a mortality of 17.9 percent with the employment of intestinal decompression in their patients.

Two hundred and twenty-one cases of acute small bowel obstruction were reviewed during the 1945-1953 period. The data was extracted from the clinical records of St. Francis Hospital, Evanston, Ill., and this hospital. Acute mechanical and vascular occlusive small bowel obstruction was verified at autopsy or surgical intervention in 185 patients. The remaining 36 patients were those responding to conservative management whose clinical picture satisfied the criteria for acute small bowel obstruction. Transient obstructions on a neurogenic basis were excluded from the study, but mesenteric thrombosis and atresias were included. The latter two types of obstructions are frequently omitted from studies of this nature because they bear unfavorable mortality rates, but in a clinical study of acute small bowel obstruction, these obstructions are indistinguishable preoperatively, and should be incorporated in the review.

It was noted that the incidence of acute small bowel obstruction related to surgical admissions increased from 0.36 to 0.68 percent during the latter portion period studied. This increase was probably due to adhesion band obstructions, which accounted for 55 percent of the cases. This high value may be the result of the increased number of explorations of the peritoneal cavity. Hernias, intestinal anomalies, neoplasms, gallstones, mesenteric thrombosis, and regional ileitis completed the remainder of the group. Their relative incidence was in the order mentioned (fig. 1).

From U. S. Air Force Hospital, Bolling Air Force Base, Washington, D. C.

FACTORS INFLUENCING MORTALITY

Strangulation influences both the mortality and the treatment of this condition. Mesenteric thrombosis carries the highest strangulation rate and consequently has the highest mortality, although medical complications in this group may also influence the mortality. Neoplasms were strangulated in 25 percent of the

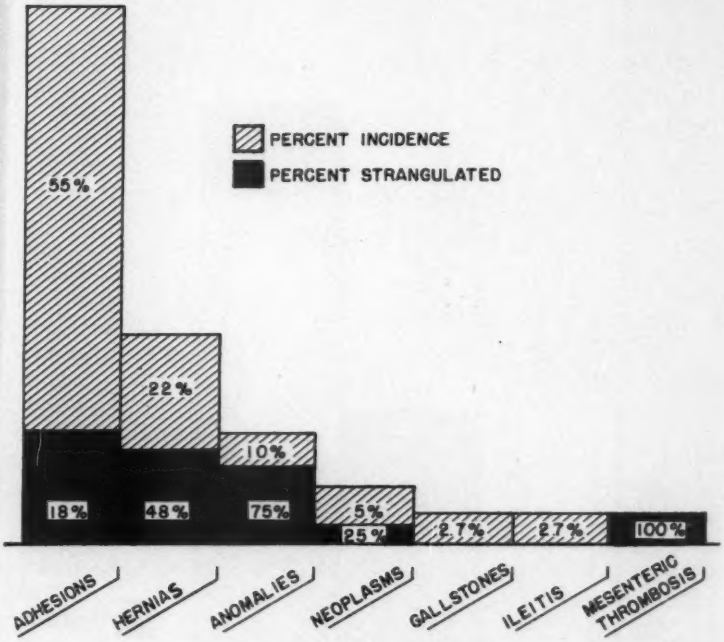

Figure 1. Cause, incidence, and pathologic findings in 221 patients with intestinal obstruction.

patients as a result of intussusception which they had precipitated. Hernias were implicated in strangulated obstruction at a 48 percent rate; notably among those resulting in strangulation obstruction were Richter's, femoral, and internal hernias. Adhesions were responsible for a relatively low incidence of 18 percent; because of this low strangulation rate conservative therapy may only be justified in this form of obstruction. In general, 32 percent of the acute obstructions had impairment of the blood supply. A striking relation of the degree of leukocytosis and febrile response in strangulation to mortality may be illustrated by plotting them against the mortality (fig. 2).

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Closed Loop. A particular problem in the study was that of "closed loop" obstruction, that is, the gastrointestinal tract is obstructed at two separate points and in effect isolates an obstructed loop of bowel. This occurs in volvulus and internal hernia, and was observed in 10 percent of our patients. Of these

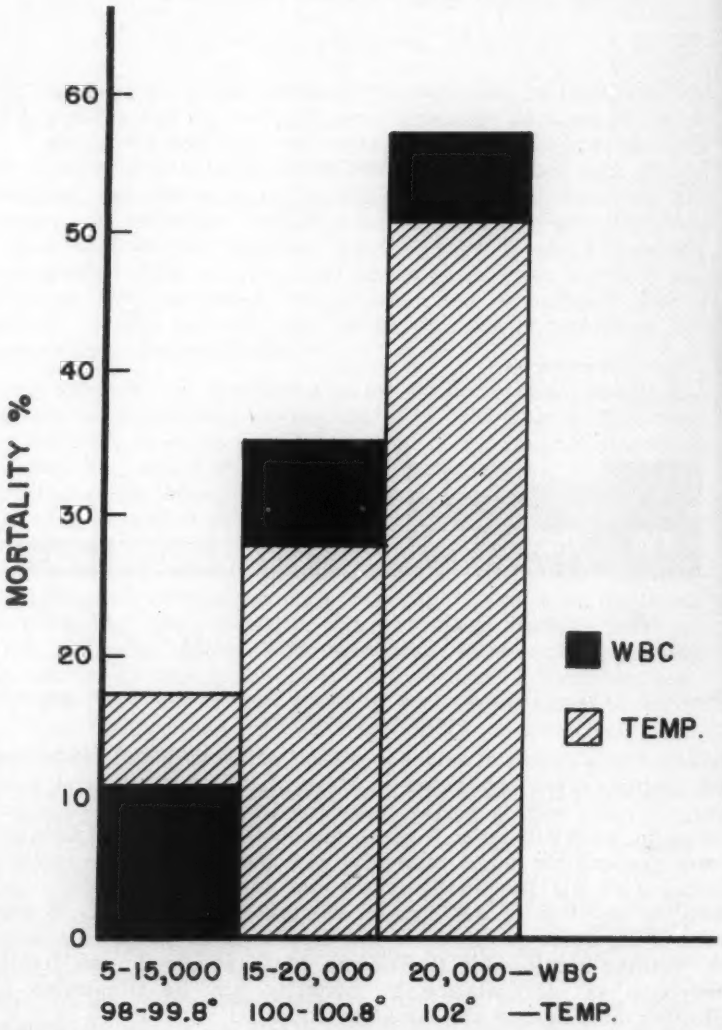

Figure 2. The relationship of the temperature and white blood cell count to the mortality.

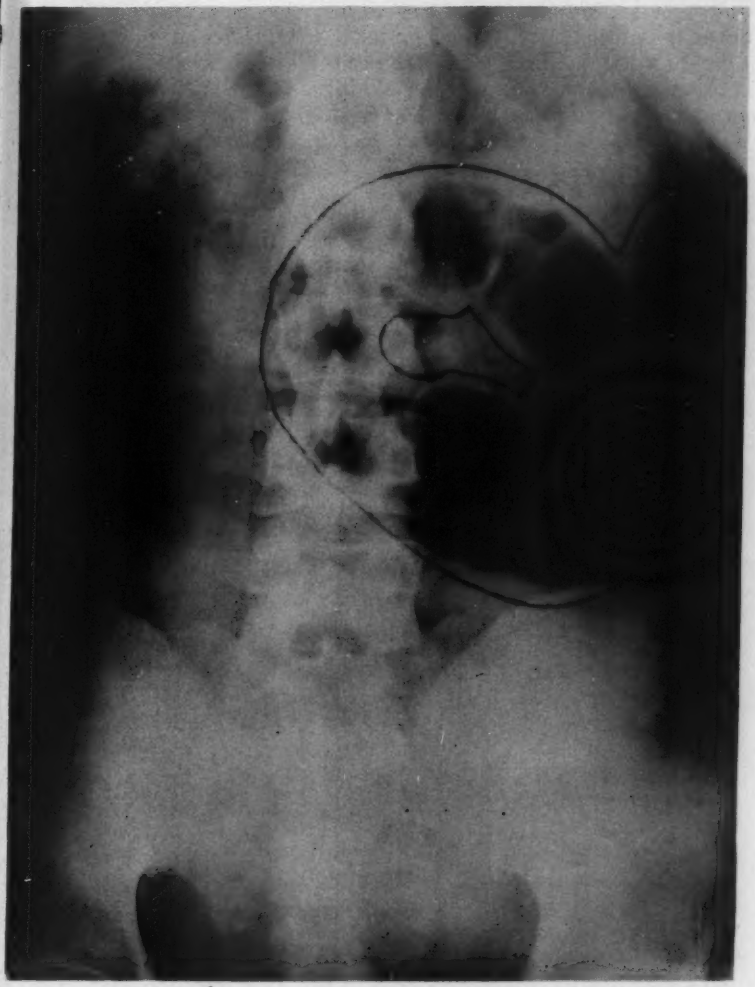

Figure 3. Roentgenogram of a patient who was not clinically distended, but roentgenographic examination revealed a strangulated closed loop obstruction (outlined).

91 percent were strangulated and caused a mortality of 27 percent. The basic problem was the difficulty in making the diagnosis sufficiently early. Consequently, advanced pathologic changes were found at laparotomy or the diagnosis was entirely missed. Complicating the delay in diagnosis is the disturbing knowledge that strangulation proceeds more rapidly in closed loop obstruction. The classical signs of acute small bowel ob-

struction are minimal in these cases; vomiting and obstipation occur less frequently. Of our patients with a closed loop obstruction, only 23 percent had abdominal distention, and in only 50 percent did the roentgenograms reveal a distended loop and could an abdominal mass be palpated (figs. 3 and 4). Probably the most reliable criteria in management was to observe for signs of im-

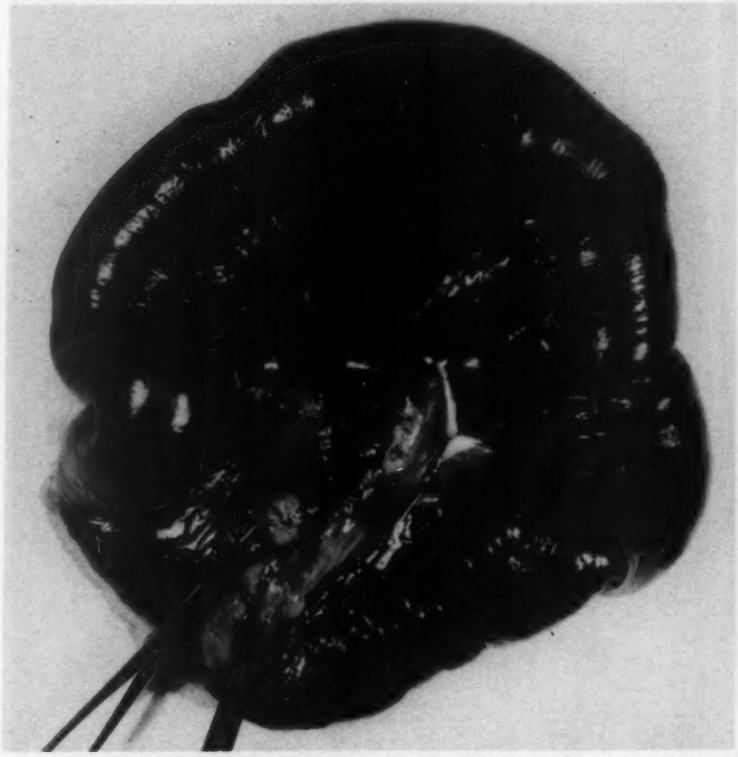

Figure 4. Photograph of the loop of resected ileum which was observed in the roentgenogram in figure 3.

pending strangulation: increased pain, increased abdominal tenderness, increased pulse rate, development of a palpable mass, and, finally, signs of absolute strangulation: muscle spasm, rebound tenderness, fever, leukocytosis, and finally shock.[4]

Delay and Operative Procedure. Delay by the patient in seeking medical aid results in increased mortality. A rising mortality rate is noted when the delay or the duration of unrelieved symptoms is plotted against the mortality, particularly after 48 hours prior to the institution of some definitive form of treatment.[5]

It follows, that, in neglected cases with advanced pathologic changes in the bowel, more extensive surgery must be performed in a patient whose electrolyte and fluid reserves are already depleted. The effect of this experience on the mortality is clearly illustrated in table 1.

TABLE 1. *Relation of operative procedure to mortality rate in 176 patients*

Surgical procedure	Number of patients	Mortality rate (percent)
Release of obstruction	112	.9
Release of nongangrenous bowel	16	6.2
Resection of gangrenous bowel	33	30.9
Resection of perforated gangrenous bowel	15	40.0
Total	176	10.2

Limiting Conservative Therapy. Although intestinal decompression has markedly reduced mortality rates, its misuse may actually increase mortality. It appears that the hazard of unnecessary surgery is less than the failure to relieve obstruction by conservative means. Definitive decompression therapy must not be used in the presence of strangulation or continued in the absence of signs of improvement. The point of the need for surgical intervention due to strangulation is much sharper than the point at which the failure of decompression therapy necessitates operation. Therefore, the period of conservative treatment, if unsuccessful, should be limited to 24 hours; operative intervention is then mandatory inasmuch as further delay is associated with a rapidly increasing mortality. In 68 cases, a definitive form of decompression therapy was initiated and, although the suction tube passed the pylorus in over 80 percent of the patients, a satisfactory outcome resulted in only 32. In the remaining 36 patients, surgical intervention followed a period of unsuccessful conservative therapy. The mortality was proportional to persistence of conservative therapy in face of the failure to relieve the obstruction (table 2).

It may be noted that the 16.6 percent mortality in this group was higher than the over-all mortality of all forms of intestinal obstruction included in this study. In further contrast, a mortality of only 8.3 percent was noted in the 130 patients who underwent

immediate surgical relief for all forms of acute small bowel obstructions.

Pathology. The basic pathologic process has its own inherent mortality as illustrated by the deaths due to mesenteric thrombosis and neoplastic obstructions. Surgical mortality rates of 75 and 25 percent are noted in these obstructions. Mortality rates due to congenital defects, adhesions, regional ileitis, and gallstones followed in that order. An over-all mortality rate of 10.2 percent in the entire surgical group of 176 patients was recorded.

TABLE 2. *The mortality rate related to duration of unsuccessful decompression prior to surgical intervention*

Duration of therapy (hours)	Number of patients	Mortality (percent)
0-24	10	0
24-48	9	11
48-72	8	25
72-96	4	50
96-120	5	20
Total	36	16.6

Age. The greatest mortality fell in the youngest (0 to 10) and the oldest (70 plus) age groups. In the very young the high rate (15.3 percent) was due to multiple congenital deformities and the generally poor surgical risk in the newborn. The older age group carried a 19.2 percent mortality and was primarily due to poor renal and cardiac reserve, and low resistance to infection. The mortality was fairly uniform in the mid-age groups: from 10 to 30, 5.5 percent; from 30 to 50, 5.8 percent; and from 50 to 70 years, 9.9 percent.

CAUSE OF DEATH

The age of the patient influences the operative mortality as implied by the incidence of cardiac failure in 28 percent and that of bronchopneumonia in 11 percent as the cause of death; however, adequate medical management may even reduce these figures. Shock and peritonitis were responsible for 39 percent of the deaths and could have been prevented by earlier diagnosis and therapy. Electrolyte imbalance, responsible for 22 percent of the deaths, and bronchopneumonia may be minimized by limiting unsuccessful decompression therapy.

It was gratifying to note a decline in the surgical mortality in the short period studied. In the earlier portion of the period studied the mortality was 14 percent, which had decreased to 6.6 percent at the end of study.

SUMMARY

The incidence of acute small bowel obstruction is increasing as a result of greater frequency of surgical exploration and increasing longevity of the present-day patient. Mortality in this condition may be reduced by earlier diagnosis of strangulation obstruction, recognition of closed loop obstruction, limiting unsuccessful decompression therapy to 24 hours, use of wide-spectrum antibiotics, and judicious use of fluid and electrolyte balance.

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URINARY INCONTINENCE

The problem of curing incontinence in the female is a dual procedure. First, all pathologic conditions within the urethra itself must be removed; and second, necessary repair of any of the other factors responsible for lowered urethral resistance must also be accomplished, including the strengthening of pubourethral ligaments. The reason for a 15 to 20 percent failure of surgical procedures to cure incontinence is that most surgical operations are designed to correct only one or two of the factors responsible for lowered urethral resistance. Before any surgical procedure is undertaken it is necessary to examine and test all of the factors responsible for continence. This assumes a careful painstaking history, a general physical examination, complete urological investigation, and a complete gynecologic survey.

—HAROLD T. LOW, M. D.
in *Rocky Mountain Medical Journal*,
p. 519, June 1954

SURGERY OF NONTRAUMATIC CARDIOVASCULAR LESIONS IN KOREA

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THE progressive development so evident today in every branch of modern surgical science and technic has taken place in the field of cardiovascular surgery only within the past 15 years. Despite great interest and investigation as early as the late nineteenth century, as well as such singular successes as Matas'[1] work on aneurysms and Cutler and Levine's[2] and Souttar's[3] mitral valvulotomies (1923-1925), no sustained advancement against the problems of cardiovascular pathology had been made prior to the late nineteen-thirties. Many surgeons of that time believed that Billroth's[4] advice of 1883, "Let no man who hopes to retain the respect of his medical brethren dare to operate on the human heart," was well-founded.

With Gross'[5] successful ligation of the patent ductus arteriosus in 1938, Blalock and Taussig's[6] solution in 1944 of the problem of the cyanotic child with tetralogy of Fallot, and the first successful operation for coarctation of the aorta by Crafoord[7] in the same year, the golden age of cardiovascular surgery began. That the specialty has been rapidly and thoroughly, though certainly not yet completely, developed in these few years is attested to by the multiplicity of conditions now amenable to surgical correction and by the low mortality associated with the operative procedures.

Gross[8] has recently reported an over-all mortality of 1.7 percent in 568 patients in whom the patent ductus arteriosus was completely divided. In those patients without failure or infection prior to operation, the mortality rate was less than 0.5 percent. Potts[9] has had no deaths in 214 operations for the same condition in children from 10 months to 15 years of age.

In handling the more complicated problem of pulmonary stenosis as a component of tetralogy of Fallot, Taussig and Bauersfeld[10] reported an immediate mortality of 15 percent in 857 patients. The over-all loss in this series was 17 percent. In a group of patients

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with isolated pulmonary stenosis treated by valvulotomy through the ventricular wall, excellent results were obtained in 61, with an over-all mortality of 13 percent.[11]

Bahnson[12] reported operative repair of coarctation of the aorta in 119 patients with a mortality of only nine percent. Similarly, Gross[13] reviewed 100 operations for coarctation (nine of which were for exploration alone) and found a mortality of 11 percent; however, in the last 100 patients reported by him there were but two deaths.[14] He ascribed this improvement to better selection of patients, the avoidance of cyclopropane anesthesia, and increasing experience with the operation.

A dramatic illustration of the rapid growth and improvement of cardiac surgery is shown in the fulfillment of Bailey's[15] somewhat startling prediction in 1949 that the mortality of valvulotomies for mitral stenosis could be reduced to five percent. His group at Hahnemann Hospital have already attained that goal.[16]

Lest it be assumed that these excellent results are obtained only by those having the greatest experience with each particular procedure, results of other workers should be noted. Glenn and Whittemore[17] in reporting 100 operations performed for congenital heart disease at Yale University Hospital reviewed 44 operations for patent ductus arteriosus (28 divisions, 16 ligations), none of which resulted in death. They performed the Blalock-Taussig procedure on 25 patients with tetralogy of Fallot with a mortality of eight percent, and resected 15 coarctations with the loss of one patient. At the New York Hospital-Cornell Medical Center,[18] 33 operations for patent ductus arteriosus have been done with no deaths, a similar number of mitral valvulotomies with a mortality of six percent, and 23 operations for coarctation of the aorta with a mortality of five percent.

These results indicate that cardiovascular surgery has reached maturity and is no longer a prohibited, awesome field. During this maturation many surgeons have gained experience in this type of surgery. Many of the simpler conditions affecting the heart and great vessels are readily diagnosed by routine means and similarly can be handled surgically in a relatively routine manner. It is our belief that, when necessary, these less complex problems can be handled successfully by experienced men in the average hospital offering the usual, if not ideal, facilities. The Korean conflict has demonstrated not only the advisability but the feasibility of early arterial surgery with repair by anastomosis or grafting in just such installations. The success of this program and the number of limbs saved by this positive approach is encouraging.[19] Though the extremely low mortality of the larger centers may not be equaled in such nontraumatic

work, the prognosis with operation under compromised conditions is considerably brighter than that of the disease untreated by surgery. Frequently there is no other alternative. With our armed services today deployed throughout the world, surgeons are frequently confronted with such problems, especially in the war-torn and occupied countries.

We have recently had the opportunity in Korea with the First Marine Division to see two examples of such pathology—a class III-IV mitral stenosis and a symptomatic, partially disabling patent ductus arteriosus—and have performed successful procedures on them. These procedures were done with reluctance because of the lack of ideal facilities, but as both patients were natives of Korea such were not available to them. These cases are presented in the hope that other surgeons faced with the same problem may gain some assurance from them.

CASE REPORTS

Case 1. A 29-year-old woman was first seen in the spring of 1953 with the complaints of progressive dyspnea, cough, palpitation, and generalized edema. She gave a history of a febrile illness at the age of five which was suggestive of rheumatic fever, and a history of recurrent attacks of dyspnea, orthopnea, and anasarca for the previous two or three years. Since the onset of a pregnancy seven months previously these attacks had occurred with greater frequency, and the patient was almost completely bedridden. Physical examination revealed four plus pitting edema of face and lower lips, moist rales bilaterally, increased cardiac dullness, and a rumbling presystolic mitral murmur. The uterus was symmetrically enlarged to a point two to three fingersbreadth below the umbilicus and there was no hepatomegaly.

On admission to the medical company and with the aid of digitalis, diuretics, and controlled fluids and diet the cardiac failure was relieved. In her ninth month of pregnancy the patient was delivered of a normal, healthy child. As the patient attempted to return to even limited activity postpartum, however, she relapsed into severe cardiac failure, and it was possible for her to be out of bed for only a short time each day. It was believed that her mitral stenosis was progressing and that medical therapy had little to offer for permanent improvement.

In October 1953, three months postpartum, the patient was transferred to this hospital ship. Examination upon admission again revealed evidence of mitral stenosis with moderate cardiac failure; the pulse rate was 72 per minute, the blood pressure 104/68. Chest roentgenograms showed moderate cardiac enlargement, most marked at the left atrium and pulmonary artery,

and a small area of thickening overlying the lower-right middle lobe which yielded no fluid on thoracentesis. Laboratory studies revealed a normal white blood cell count and differential save for a slight eosinophilia, a hemoglobin of 9.5 grams per 100 cc., serum protein of 8.2 grams per 100 cc., with a reversed albumin globulin ratio (albumin, 4.0 grams; globulin, 4.2 grams). The serology test was negative.

An improvised Bailey guillotine type finger valvulotome was prepared from available instruments. On 13 October 1953, after the cardiac failure had been partly relieved and the patient prepared with whole blood and antibiotic therapy, a left exploratory thoracotomy was performed. The left atrium and pulmonary artery were enlarged, the auricular appendage contained no evident thrombus, but there was a definite thrill over the anterior wall of the left ventricle. No other cardiac or vascular pathology was evident. The tip of the left auricular appendage was amputated and digital exploration of the atrium revealed a firm stenotic mitral valve with an orifice estimated to be 6 to 7 mm. in diameter. There was no regurgitant jet of blood palpable within the atrium. The commissures of the valve were then "fractured" by digital pressure to the extent that a large index finger could easily be passed into the ventricle, and it appeared that considerable flutter motion of the leaflets had been restored. Following this maneuver, the palpable ventricular thrill disappeared. The valvulotome was not used.

The patient's postoperative course was uneventful. Moderate amounts of serosanguineous fluid were aspirated from the left pleural cavity on two occasions, following which the lung completely re-expanded. The patient was slowly but progressively ambulated, and she was discharged from the hospital 30 days after her operative procedure. When last seen, five months postoperatively, the patient showed marked clinical improvement and had returned to full activity, being able to perform the many duties expected of Korean women. She is now able to walk the three miles' round trip from her home to her husband's rice mill daily with only short periods of rest. The mitral murmur has diminished slightly in intensity but has persisted. The accentuated first mitral and second pulmonic sounds have both persisted. There is no evidence of peripheral edema and both lungs are clear save for the area of pleural thickening of the right side which remains unchanged.

Case 2. This 9-year-old girl was first seen in December 1953, with the complaints of easy fatiguability and dyspnea on exertion of at least several months' duration. Her parents had observed that she was not as large as other children of her age, and could not participate as strenuously as they in physical exercise. Phys-

ical examination revealed a well-nourished child, appearing younger and smaller than her stated age, in no apparent distress and without cyanosis. The chest expanded equally and symmetrically and the lungs were clear to percussion and auscultation. There were visible impulses over the apex of the heart and over the second left intercostal space, just lateral to the sternal border. A continuous thrill, most forceful in the anterior second left intercostal space, was palpable, and a somewhat high pitched, continuous "machinery" murmur best heard in this area was also widely transmitted over the chest. There was no evidence of clubbing of the fingers. A tentative diagnosis of patent ductus arteriosus was made and the patient transferred to this hospital ship for further studies.

Laboratory tests revealed a hemoglobin of 12.5 grams per 100 cc., hematocrit of 29 mm., and a white blood cell count of 10,900 with normal differentials save for six percent eosinophils. Fluoroscopic and radiographic examination of the chest revealed no pulmonary pathology and the over-all size of the heart was within normal limits; however, there was prominence of the left ventricle, fullness of the pulmonary artery shadow, and evident hilar dance over the area of the hilus of the left lung. Electrocardiographic examination presented changes thought to indicate left auricular and ventricular hypertrophy.

On 6 January 1954, under endotracheal ether-oxygen-nitrous oxide anesthesia, a left thoracotomy was performed. A patent ductus arteriosus measuring about 1.8 cm. in length and 1.0 cm. in width was found; no other cardiac or vascular pathology was evident. The ductus was dissected free from the surrounding tissues, and with the aid of Pott's patent ductus forceps was divided and each end securely sutured.

The patient was ambulated progressively, her postoperative course was uneventful, and she was discharged from the hospital on the sixth postoperative day. The "machinery" murmur and thrill have completely disappeared, and the child has resumed her full activities.

SUMMARY

A review of the operative treatment of the less complex cardiovascular conditions and the operative mortality rates reveals that operation for these conditions is becoming a routine and reasonably safe procedure.

Two such operations performed in Korea—one a mitral valvulotomy (believed to be the first performed in the Orient), the other a division and suture of a patent ductus arteriosus—demonstrate that when necessary such procedures can be success-

fully done in the absence of ideal facilities. Even under such conditions the operative mortality is considerably lower than the nonoperative.

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THE SIGNIFICANCE OF SPIKE-DOME DISCHARGE IN THE METRAZOL-ACTIVATED ELECTROENCEPHALOGRAM

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THE economic and social implications which accompany the diagnosis of epilepsy cannot be overemphasized. In some countries the epileptic might be a hero or even a god; here he is an economic pariah, and is considered physically unfit to serve his country. The diagnosis of epilepsy is thus of paramount importance in the armed services, and every diagnostic tool available should be used to establish such a disorder without a reasonable doubt.

Since Berger's[1] discovery of brain rhythms in 1924, the literature has been steadily augmented by evidence that various rhythmic patterns imply certain syndromes due to cerebral activity. Gibbs and Gibbs[2] pointed out that epilepsy could be defined in terms of electrocortical events represented in the electroencephalogram as paroxysmal, cerebral dysrhythmia, and they described four types of epileptoid patterns with which we are all familiar: petit mal, petit mal variant, grand mal, and psychomotor. They further stated that the electroencephalogram during petit mal attacks was characterized by a spike-dome formation elicited prominently from frontal and precentral cortical regions. Other workers in this field classified electroencephalographic tracings according to abnormal features of voltage manifestations during attack intervals. Such classification not only involved cortical geography but also emphasized the wave pattern with respect to form. It has been pointed out, too, that evidence of certain paroxysmal sequences was not sufficient to predict the form of disturbance the patient might be expected to have from the wave form alone.

Paroxysmal electroencephalograms of the petit mal type are the typical three per second wave with a preceding spike and the variant of a two per second saw-tooth wave with preceding serial spikes. Both of these types occur in the metrazol (pentylenetetrazol) -activated electroencephalogram (figs. 1 and 2,

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respectively). It must be emphasized, as Cohn[3] has stated in his recent book, the recognition of the spike and dome complex "is not pathognomonic of clinical petit mal epilepsy." He indicated that many patients might well give histories of one grand

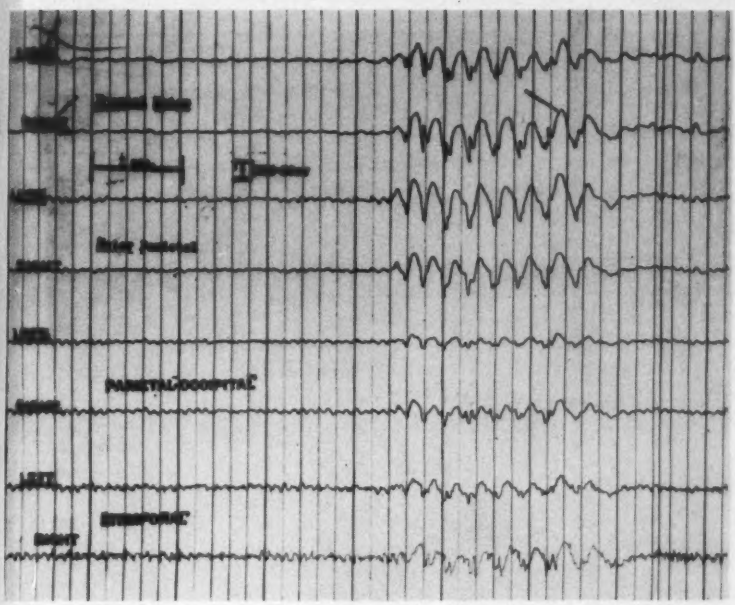

Figure 1. Electroencephalogram illustrating the petit mal complex in the metrazol-activated tracing.

mal seizure and may show spike and dome activity in their tracings, but in spite of this evidence subclinical petit mal epilepsy could not be readily established. He was specific in recommending provocative measures to induce spike-dome discharges, implying that such manifestations could well be used as an index on which to base the diagnosis of clinical epilepsy. In 1952 at the annual meeting of the Western Society of Electroencephalography, we briefly mentioned the tremendous cost to the Government of epileptics being separated from the service.[4] This cost to the taxpayers varies from $800 to $15,000, depending on the length of time the patient had been in the service prior to the diagnosis of epilepsy for which, of necessity, he is separated. We reiterate that in terms of men and service it is imperative that every effort be made to elicit an accurate evaluation of the person who is transferred to a hospital with a diagnosis of a possible convulsive disorder. Workers in this field are aware that many patients who might have clinical

epilepsy do not have the paroxysmal dysrhythmia of the spike-dome formation. All agree the grand mal convulsions of epilepsy are relatively easy for a trained observer to recognize, but many people who have seizures, and normal electroencephalograms subsequently, are retained on active service until the diagnosis

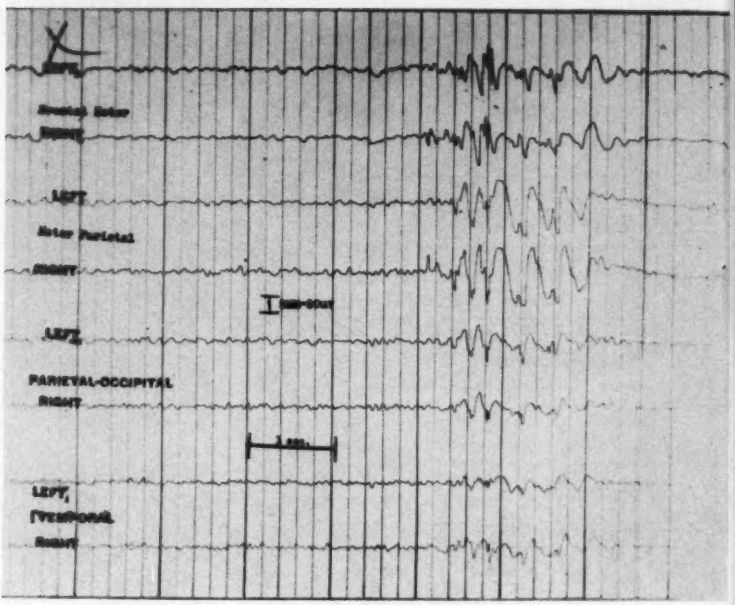

Figure 2. Electroencephalogram illustrating the petit mal variant complex in the metrazol-activated tracing.

is clinically established. Therefore, the need for evoking an abnormal electroencephalographic tracing in otherwise apparently normal persons becomes of paramount importance.

METHOD

It has been the policy of this hospital, in suspected cases of convulsive disorder, to record a minimum of five electroencephalograms. These are done at daily intervals. The fifth tracing is obtained during intravenous activation by metrazol, which is injected at the rate of 100 mg. per minute until a total of 300 mg. is reached. Most of the breakdowns occur after 200 mg. are given. All of them occur within 10 seconds after administration of the 300 mg.

A control group of 100 preshock electroencephalographic tracings with metrazol activation in psychotic patients was

compared with 100 metrazol-activated electroencephalographic tracings on clinically verified epileptic patients who showed previous normal records. The results are tabulated in table 1.

TABLE 1. *Incidence of electroencephalographic findings in epileptic and psychotic patients receiving metrazol*

Diagnosis	Number of patients	Electroencephalographic findings			
		Normal	Borderline	Paroxysmal dysrhythmia	Spike-dome discharge
Epilepsy	100	22	3	35	40
Psychosis	100	86	7	6	1

From this table it may be seen that of the 100 clinically confirmed epileptics, 22 revealed normal electroencephalograms, three were borderline, 35 showed a conventional paroxysmal dysrhythmia, and 40 a paroxysmal dysrhythmia with a spike-dome configuration. Only one of the group of psychotic patients who had a paroxysmal dysrhythmia showed the spike-dome complex. Cohn and associates[5] indicated this relationship in their series of 75 cases. It is interesting to note that of this series, 13 of the

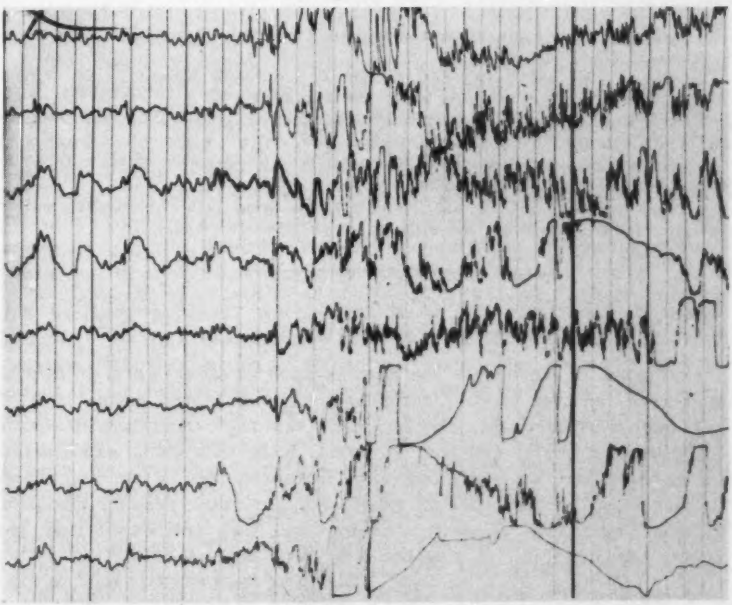

Figure 3. Electroencephalographic tracing of a metrazol-precipitated convulsion, illustrating the initial spike-dome discharge.

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confirmed epileptics had grand mal seizures during metrazol activation. It is also noteworthy that during these seizures the electroencephalogram universally showed an initial spike-dome discharge (fig. 3). This was followed by the usual build-up in amplitude and frequency.

CONCLUSION

The use of electroencephalographic tracings as a diagnostic aid in establishing the presence of idiopathic epilepsy is adequately delineated in the literature. In the military service, however, the burden of proof for this diagnosis rests with the neurologist. Procedures to expedite the validity of the diagnosis are therefore stressed. The methods described for establishing the diagnosis at this hospital, furnish what we consider ample evidence to support the diagnosis. The results of the data obtained from the records of 100 metrazol-activated epileptic patients were compared with those of 100 psychotic patients. The conclusion drawn would tend to indicate that the spike-dome discharge occurring during metrazol activation is of much more diagnostic significance than the nonspecific generalized paroxysmal dysrhythmia.

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PRIMARY CANCER OF THE LUNG

Carcinoma of the lung is the most common visceral cancer in man; it accounted for over 24,000 deaths in the United States during 1953. It has been estimated that the incidence of lung cancer has increased 1,500 percent during the past 25 years. It is difficult to explain this increase on the basis of longevity, increased population, and errors in pathologic interpretation 25 years ago. The cause remains unknown, although excessive cigarette smoking over long periods of time has come under suspicion as a probable factor of importance.

—FRANK PHILIP COLEMAN, M. D.
in *Clinical Medicine,*
p. 439, June 1954

GASTRIC RESECTION IN MILITARY PERSONNEL

ROBERT M. HARDAWAY, III, *Lieutenant Colonel, MC, USA*

MANY surgeons believe that in gastrectomy for peptic ulcer, the more of the organ that is removed, the less likelihood there is for recurrence of the ulcer.[1-3] Increasingly radical procedures have been done, removing as much as seven eighths of the stomach in an attempt to reduce to a minimum the recurrence rate and to produce a persistent achlorhydria. This has been successful in large series which show a recurrence rate of two percent or less.[3,4]

These seemingly excellent results, however, have been marred by an increasing number of patients who, though cured of peptic ulcer by partial gastric resection become partially disabled because of vomiting, colic, dumping syndrome, inability to maintain weight, or other disabling symptoms. Johnson and Orr[4] found that in 222 patients, following radical gastrectomies (removal of from four fifths to seven eighths of the stomach), 42 percent had colic, 24 percent had vomiting or regurgitation of bile, and 47 percent had dumping or hypoglycemic syndromes. Only 42 percent said that they were "cured" of their "stomach trouble." Analyzing the results in 670 patients who had a more conservative gastrectomy (removal of two thirds of the stomach) they found that only 18 percent had colic, 14 percent had vomiting or regurgitation of bile, and 18 percent had dumping or hypoglycemic syndromes. Sixty percent believed they were "cured."

In military surgery, the object is to "maintain the fighting strength," or return as many patients to full military duty as possible. Whether a man is partially disabled because of recurrent ulcer or because of a smaller stomach is of little consequence. It would seem, therefore, that a policy in the military service of conservative resection of about two thirds of the stomach for duodenal ulcer is indicated. The resection must be varied for gastric or duodenal ulcer, malignant or benign ulcer, high or low gastric acidity, and other findings. In addition, the estimation of the amount of stomach removed is difficult.[5] Weighing the stomach is inaccurate because of variation in the amount of fat and of edema. Depending on the amount of duodenal obstruction, there may be considerable hypertrophy of the stom-

From U. S. Army Hospital, Fort Belvoir, Va.

ach wall. An estimation of square centimeters of stomach wall removed does not take into account the total original size of the stomach. The amount of tissue remaining is the important factor. Wangensteen and Lannin[1] devised a formula by which they attempted to determine the percent of tissue removed, but its accuracy has not been proved. Possibly the best method is for the surgeon to make a careful estimate in consecutive cases of the size of both the removed and remaining portions of the stomach.

During the past three and one-half years this procedure has been carried out at this hospital. Most gastrectomies have been done by or with the assistance of the same surgeon. Most have been of the posterior Polya type, using a very short jejunal loop, in which about two thirds of the stomach was excised for the average duodenal ulcer. The patients on whom gastrectomy for duodenal ulcer was performed had been completely incapacitated because of obstruction, repeated hemorrhage, recurrent perforation, or failure of medical treatment. One patient was operated on because of massive, uncontrollable, acute bleeding from a large penetrating duodenal ulcer. There were no deaths or complications. Of the 30 patients who had partial gastrectomies during the past three and one-half years, 16 have been followed for a period of one year or more. Ten of these were operated on for duodenal ulcer, five for gastric ulcer, and one for carcinoma of the stomach. All 16 are employed full time either in the military service or in a civilian job. Two occasionally have vomiting or regurgitation but the others are free of symptoms. Although this series is too small to draw any conclusion, it supports the observations and results of others.[4]

CONCLUSION

It is suggested that in the surgical treatment of persons with peptic ulcer in the military service, a conservative gastrectomy with removal of about two thirds of the stomach will permit such patients to perform a maximum of effective duty.

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WILLIAM CRAWFORD GORGAS, MASTER SANITARIAN

MAJOR GENERAL SILAS B. HAYS
Deputy Surgeon General, U. S. Army

ONE hundred years ago, William Crawford Gorgas was born in a suburb of Mobile, Ala. Fifty-four years ago, at the age of 46 years, he began the work that was to make him famous. Thirty-four years ago, at the age of 66 years, he died. Into the last 20 years of his life were packed his great accomplishments. It was his work in the eradication of yellow fever on the Isthmus of Panama that made possible the construction of the Panama Canal.

Who was this man and what was he? Although his triumphs were in the field of medicine, he was not in the ordinary sense of the word a scientist, nor was he a great clinician. Primarily, Gorgas was a soldier and an administrator. He was probably the greatest sanitarian of all time. He was Surgeon General of the Army, and he became President of the American Medical Association. He was an international consultant on health problems. During all of his triumphs he remained a gentleman in the tradition of the Old South, honest and unassuming. Even while he was engaged in his hardest work he loved to join with his charming wife in entertaining his many friends. He led a full and happy life.

Urban yellow fever, which he was destined to help conquer, played an almost uncanny role in his life. His father, a West Point graduate and an ordnance officer in the regular Army, was in command of the arsenal at Mount Vernon, a few miles from Mobile, in 1853, when one of the worst epidemics of yellow fever swept the Gulf states. New Orleans, Vicksburg, Biloxi, and Mobile were all stricken. Many of the residents of Mobile repaired to Mount Vernon to avoid infection. One of these was Amelia Gayle, daughter of the Governor of Alabama. Captain

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Presented on 1 October 1954 in Mobile, Ala., at a civic celebration and unveiling of a bust of General Gorgas in observance of the centennial of his birth on 3 October 1854 in nearby Toulminville. At the dedication of the Alabama Hall of Fame in Montgomery, on 14 October 1954, a bronze plaque memorializing him and other illustrious Alabama citizens is being unveiled.

The photographs of General Gorgas are from the art collection of the Armed Forces Medical Library.

Gorgas became her suitor and after a short courtship they were married. On 3 October 1854, their first son, William Crawford Gorgas, was born at the old Gayle place at Toulminville, near Mobile. A Mobile physician, Dr. Josiah Nott, of whom more will be said later, was the obstetrician.

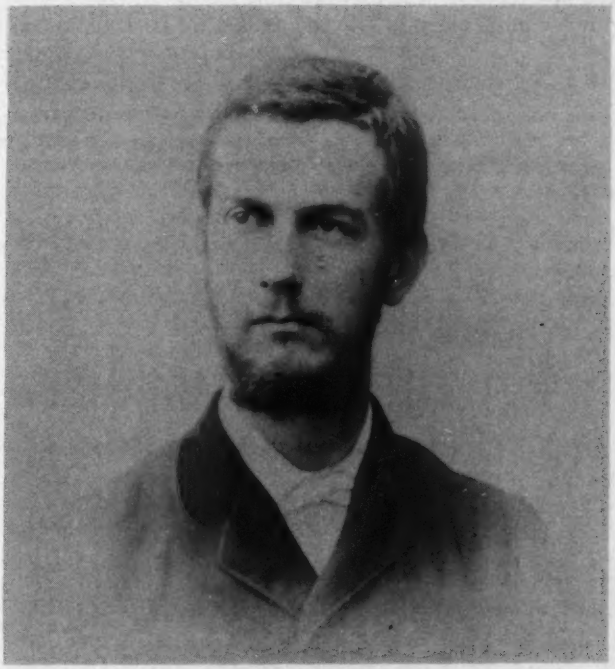
Young Gorgas' childhood was spent at various military posts. In 1860 his father, like Robert E. Lee and many other great military men, cast his lot with the Confederacy and became Chief of Ordnance of the Confederate Army. Following the war, Gorgas' father served as President of the University of the South at Sewanee, Tenn. It was here that young Gorgas completed his undergraduate education. Throughout his youth he yearned for a military career, and tried on many occasions to secure an appointment to West Point. Failing in this, and apparently only as a means to an end, he decided to study medicine so that he could enter the Army as a doctor. It appears that although this expedient was somewhat distasteful to him at the outset, he soon became enthusiastic about his studies and was an excellent student.

In 1878 an incident concerning yellow fever occurred while he was attending medical school in New York. Memphis was having a serious epidemic—17,000 cases—which resulted in 5,000 deaths. Gorgas, along with several other medical students who had decided to volunteer their services, proceeded to that stricken community. Officials met them, however, and politely refused to let them into the city, as none of them had had the disease and hence were not immune. They returned to New York and to their studies without seeing a patient.

On completion of his internship at Bellevue Hospital in New York, Gorgas successfully passed the examination for entrance into the Medical Corps of the regular Army, and was commissioned a first lieutenant in June 1880. One of his first assignments was at Fort Brown, near Brownsville, Tex., and here again yellow fever exerted its influence on his life. The disease was prevalent when he reported for duty, not only in the Fort itself, but also in Brownsville, and in Matamoras across the river in old Mexico. Marie Doughty, a young lady who was visiting relatives at Fort Brown, became ill with the fever and Gorgas attended her. Soon he, too, was stricken. Fortunately, neither died and during convalescence they saw a great deal of each other. Their illness was responsible for two things; it gave Gorgas immunity so that he could work with yellow fever without fear of infection, and it was instrumental in bringing him a wife. Two years later he and Marie were married.

From the standpoint of his major accomplishments, the next 18 years were uneventful. He served at many posts and performed

his duties creditably as a medical officer. In 1898 came the Spanish-American War. Following hostilities the United States established an occupation force in Cuba, with Leonard Wood as



Gorgas as a youth. His father was chief ordnance officer of the Confederate Army.

Military Governor. It is interest that Leonard Wood himself was an Army physician who had left the practice of medicine to become a line officer. During the war with Spain he was the commander of the famous Rough Riders, with Theodore Roosevelt as his assistant.

It is impossible to discuss Gorgas without discussing yellow fever. Havana in those days was a hotbed of disease. Malaria and the intestinal diseases were rampant, but yellow fever with its high mortality was the most serious. For 300 years this disease had plagued the Western Hemisphere. Its focus seemed to be in the tropics, but at irregular intervals it suddenly would strike temperate regions, always in the summer and always following trade routes. An epidemic in Philadelphia in 1793 killed about 4,000 people. Baltimore, Charleston, Norfolk, and other East Coast cities were involved on many occasions, but the Gulf Coast suffered most severely, with epidemics being re-

corded frequently in Mobile, New Orleans, Pensacola, and Galveston. In 1853 New Orleans had 8,100 deaths, and Mobile had 1,191 out of a population of 18,000. A brief description of the Memphis epidemic of 1878 illustrates the devastating effect of yellow fever on a community. The following is a quotation from Dr. S. R. Bruesch's report on the disasters and epidemics of Memphis:

When 22 new cases were announced the morning of August 15, the citizens began a rush, passing all bounds and limits of sense, to get out of Memphis. Those who scared less easily were convinced when 33 new cases were announced on the sixteenth of August, and the whole population was precipitated into a panic. All business was stopped; stores and offices were closed. Although railroads were the most popular means of escape, every possible conveyance was put to use. In less than 10 days (by August 24) 25,000 people had fled from the city, leaving fewer than 20,000 persons to face the consequences of an enemy they could not escape. By mid-September it was estimated that the population numbered 19,600, of whom 14,000 were Negroes. When the epidemic ended in the latter part of October, roughly 17,600 cases of yellow fever had occurred out of this population of somewhat less than 20,000. The mortality was placed at 5,150, although the exact number can never be known. The mortality rate was much higher in the white population (75 percent) than among the Negroes (7 percent). It is estimated that not more than 200 of the white persons remaining in the city escaped contracting the disease. As in 1873, the toll was heaviest among the Catholic Irish and, in fact, practically eliminated this group from Memphis.

This report by an onlooker gives some idea of the desolation brought on by the epidemic:

> 'To a stranger the aspect of Memphis during the epidemic was most appalling. The principal thoroughfares as well as the lanes, alleys, and sidewalks, were saturated with lime, carbolic acid, and other ill-odored disinfectants. The streets were obscured with smoke of ignited tar and other evaporant combustibles, with a view to scatter or dissipate the *spores*. Bedsteads, ticks, blankets, whereupon patients died, might be seen burning at almost every street corner. You might walk or ride several miles on Main Street, the principal thoroughfare, and not meet five persons. Wagons and carriages were so seldom seen that their appearance lent an air of dreariness to the scene . . . . Outside each undertaker's shop were piles, if not mountains, of coffins or improvised boxes for the poor. The only evidence of living humanity seemed to be the hearses and vehicles carrying the dead to the different cemeteries.'

Signs of recovery were not so rapid in Memphis after the epidemic of 1878 as they were in 1873. Thousands of the refugees never re-

When this photograph was made in 1901 Major Gorgas had completed the job of eradicating yellow fever from Havana. In response to Secretary of War Elihu Root's request for "special recognition from the Government of the United States," Congress passed an act promoting him to the grade of permanent colonel in March 1903.

turned. The municipal government went increasingly into debt and finally surrendered its charter to the Legislature, and the city of Memphis, officially speaking, came to an end.

With the end of epidemic yellow fever in 1879, Memphis was relieved of its major peril from the river and once again could take advantage of the waters of the Mississippi for commerce and transportation. A new population moved into the deserted city, mostly from surrounding agricultural communities, to replace the Irish, Germans, and the old-time aristocracy, who either died in the epidemic or fled from the city. Memphis had managed somehow to survive the worst disasters and epidemics which the mighty Mississippi River could thrust upon its citizens. But Memphis did not survive unscarred; to this day a close observer may find signs of these scars in the cultural and social life of the city.

How was this disease transmitted? Literature, medical as well as nonmedical, was replete with learned opinions on this problem. Most of these consisted of two principal theories: that it was caused by miasmas or noxious vapors arising from swamps, or that filth and decaying matter were responsible. To a doctor in Mobile, Ala., goes the credit for first publishing the concept that insects transmitted the disease. Dr. Josiah C. Nott published a remarkable report in the *New Orleans Medical and Surgical Journal* for March 1848. I will quote only excerpts from his lengthy article:

> The morbific cause of yellow fever is not amenable to any of the laws of gases, vapors, emanations, et cetera, but has an inherent power of propagation . . . which accords in many respects with the peculiar habits and instincts of mosquitoes. All the attempts heretofore made to account for the greater activity of (the) . . . cause of yellow fever at night have failed and, in my opinion, the fact may be much better explained by a reference to the habits of insect life.

Josiah Nott lived before the age of experimental medicine. He was content to support his brilliant deductions by philosophy and logic, rather than by scientific proof. Perhaps the tragedy of the loss of four of his children due to yellow fever five years later, in 1853, discouraged him from further work on his theory. It will be recalled that Josiah Nott officiated at Gorgas' birth on 3 October 1854. How strange that the doctor who first published the correct theory of the transmission of yellow fever assisted at the birth of the man who was destined to conquer the disease.

More than 25 years later, in 1881—and now we are entering into the era of scientific medicine—another brilliant man, Dr. Carlos Finlay, of Havana, Cuba, also advanced the theory that

the disease was transmitted by the mosquito. Using human volunteers, he attempted to produce infections, always without success. Finlay clung tenaciously to his theory, however, advancing it so continuously that eventually he came to be considered almost a crank. This was the situation in Havana in 1900. Gorgas knew Finlay, was familiar with his theory and with his failures to substantiate it. Along with nearly everyone except Finlay, Gorgas subscribed to the theory that filth was the cause of the disease. Havana had been wracked for years by civil wars and was extremely filthy. Refuse rotted in the streets drawing swarms of flies and other insects. There was no sewage system, and the unpaved streets were filled with puddles of water after every tropical rain. Gorgas, with Governor Wood's powerful backing, rolled up his sleeves and went to work. In the course of a year he transformed Havana. Refuse was cleaned up, houses were scrubbed and fumigated, sewage systems were built, and the appearance and smell of the city were completely renovated.

The incidence of all communicable diseases decreased markedly and Havana became a healthy place in which to live. Even yellow fever waned, and Gorgas reported to Governor Wood that Havana was cleaner than any city in the world. Three weeks later the worst epidemic of yellow fever in years struck Havana! It was clear that filth was not responsible for contagion, and that cleanliness alone did not prevent transmission of the disease.

At this time the Surgeon General of the Army sent a commission to Cuba to study the transmission of yellow fever. The work of this commission, headed by Major Walter Reed, is an epic in the history of medicine, and in all fairness, it must be said, an epic in which Gorgas had no appreciable part. Reed and his colleagues, by brilliant experimental work in Cuba in 1900, proved that urban yellow fever was transmitted only by a certain species of mosquito and only according to definite rules, namely: that the mosquito became infected by biting an ill person in the first few days of the disease, and that at least 12 more days were required before a mosquito could produce the infection in another human. These precise time factors explained why Finlay had failed in his many experiments. The commission also proved that the disease could not be contracted by contact with a patient, nor could it be contracted from filth and decaying matter. Gorgas followed the commission's work closely and, having failed to stamp out yellow fever by cleanliness, he was ready to accept the commission's findings, reported in February 1901, and to substantiate, on a large scale and under natural conditions, the conclusions which Reed and his colleagues had reached by careful experimentation with a few cases under carefully controlled conditions.

Gorgas now had something with which to work. All the energy and zeal which had been directed to cleaning up Havana now were channeled into ridding the city of the guilty species of mosquito. Fortunately, this mosquito was a domesticated type. Its favorite habitat and breeding place was the crowded city. Its favorite blood was the blood of human beings, and for egg laying it preferred clean, quiet water in and around homes. Gorgas, the soldier, attacked this mosquito with a military campaign. He divided the city into districts and smaller subdivisions, and established an organization in which responsibility was successively delegated, down to the man responsible for only a few houses in his segment of the city. All water was eliminated, screened, or covered with oil, not only in ponds and puddles but in the rain barrels and crocks used in every home. Inspections were repeated every few days so that larvae could be killed before they were hatched. What exquisite tact must have been used in dealing with excitable housewives of Spanish extraction.

Gorgas started his antimosquito campaign in the first part of March 1901. The last case of yellow fever in the city was reported on 28 September. In eight months yellow fever, which had been present in Havana for almost 300 years, had been eliminated.

Who gets the credit? Nott, for his deductions which were ignored? Finlay, for a theory which he unfortunately was unable to prove? Reed and his commission, for their brilliant research? Or Gorgas, for his zealous application of scientific knowledge? The question answers itself—there is glory enough for all.

We now turn to the next chapter in Gorgas' life, the Panama Canal.

There had been dreams of a waterway across the Isthmus since the time that Balboa led his explorers across that narrow strip of land in 1513. As a result of the Gold Rush to California in 1850, a railroad was built across the Isthmus, mostly with Chinese and Negro labor. Malaria, yellow fever, and other tropical diseases were rampant, and it is said that there was a grave for every tie laid for that railroad. In 1880 the French undertook the construction of the Canal. In the course of nine years over 22,000 laborers died of the disease. Some groups of employees from France suffered over 75 percent mortality in their first three months in Panama. The project was finally abandoned by the French, but shortly after the turn of the century the United States signed a treaty with Panama and made plans to complete the construction of the Canal which the French had begun. President Theodore Roosevelt, realizing the importance of conquering the disease if the Canal was to be built, and being familiar with

Gorgas' work in Havana, appointed him as the Chief Sanitary Officer of the Canal Zone in 1904.

In Panama the problem facing Gorgas was much different from that in Havana. In Havana he had had the solid backing of the military governor, and he was concerned only with the city of Havana. The construction of the Canal was under a commission composed of persons who, if they were familiar with the Havana

In 1904 Colonel Gorgas was appointed Chief Sanitary Officer of the Canal Zone by President Theodore Roosevelt. He is shown here in Panama during the construction of the Canal.

experience, apparently did not realize its importance, and they were not inclined to support Gorgas with the money, supplies, and personnel which he felt were required to clean up the Canal Zone. Further, the problem in the Canal Zone was not restricted to an established city but involved towns on both sides of the Isthmus, plus construction camps along the course of the Canal. The problem of the jungle was always present, because it tended to encroach on any area which had been cleared. In Panama Gorgas' problem was not only yellow fever but also the control of all types of disease, because only by making the Canal Zone a healthful place in which to work could the Canal be constructed.

Gorgas' triumphs in Panama were even greater than those in Havana. From May 1906 until the Canal was completed in 1913, no case of yellow fever occurred in the Zone. Malaria proved more stubborn, because the mosquito which carries it is not

housebroken, but breeds and thrives in swamps, jungles, and any stagnant water.

Here again, as he had in Havana, Gorgas planned and executed a military campaign against the mosquito. Each locale was divided into districts, each being supervised by an inspector. He instituted an "Anopheles Brigade" to eradicate the malaria mosquitoes, and a "Stegomyia Brigade" to eradicate the yellow fever mosquitoes. His success can be attributed to several factors. First, he saw a problem and addressed himself exclusively to that problem. Second, he developed a plan to deal with it and an organization through which his plan could be executed. Third, by his tenacity and at the same time his tact and spirit of cooperation, he was able to accomplish his mission where others would have failed.

Under his leadership and management, the Canal Zone was transformed from a hotbed of tropical disease into a healthful place in which to live and work. Gorgas estimated that the health of the construction force, as measured in man-days lost because of sickness, was 13 times better than under the French. He stated, further: "During the 10 years of construction we lost by death . . . 6,630 men. If sanitary conditions had remained as they had been previous to 1904 . . . we should have lost . . . 78,000 . . . ."

His successes brought him fame long before the Canal was completed. Men and commissions from all parts of the world who were interested in tropical medicine came to Panama to see what Gorgas had accomplished and how he had gone about his work. In 1909, while he was still in Panama, the physicians of the United States gave him their greatest honor by electing him President of the American Medical Association. His fame had spread around the world, and in 1913, before the Canal was finished, the British government called on him for recommendations and assistance on health problems in connection with miners in South Africa. With a small group he proceeded to South Africa and was able to give sound advice which resulted in improvement in the health of the miners. In January 1914, while still in South Africa, he received word that he had been appointed Surgeon General of the United States Army. He returned home by way of England, where he received numerous honors from medical societies and universities.

In 1916, Gorgas was invited to travel in South America to assist in solving problems connected with yellow fever and other tropical diseases. These four months were probably the most enjoyable of his life. The trip became something of a triumphal progress for Gorgas, as he visited Ecuador, Peru, Colombia, Venezuela, and Brazil.

In 1917 the United States entered World War I. Gorgas, as Surgeon General of the Army, was responsible for the health and welfare of millions of young American soldiers. A few figures may be some index of the magnitude of his task. At the beginning of the war, there were 435 regular Army medical officers. At the time of the Armistice, there were more than 32,000 in

General Gorgas was in South Africa as a consultant to the British Government on health problems among miners when he was notified of his selection as Surgeon General of the Army. He held this high position during World War I and retired in November 1918, shortly after the Armistice was signed.

active service. At the beginning of the war the Army had less than 4,000 hospital beds. When the war ended, there were facilities in Army hospitals in this country for 100,000 patients.

Gorgas was an effective administrator. He chose excellent men as his subordinates, he delegated necessary authority to them, and let them do their jobs. He was personally acquainted with many of the great men of American medicine and he was not reluctant to call them into the service to aid him in problems which they were best equipped to handle.

Having reached 64 years of age, Gorgas was retired in November 1918. In spite of his age, he wanted to continue the fight with his old enemy, yellow fever, but fate ruled otherwise. He set out on a trip to Africa to investigate yellow fever there, traveling by way of Europe. He became ill in Belgium and later was moved to the Queen Alexandra Military Hospital in England. It was there, after an illness of several weeks, that he died. He was given a hero's funeral, and all the world mourned his passing.

For a doctor interested in public health, Gorgas was fortunate that he lived during the age that he did. During his adult life, giant strides were made in preventive medicine and the control of disease. The germ theory of disease was proved and the methods of transmission of many different kinds of disease were discovered. Gorgas was only one of a host of workers in these public health problems, but to him must go the credit for carrying out sanitation programs which saved the lives of thousands of people, and to him must go the credit for blazing the way and showing the world that through the energetic application of proved scientific principles communicable disease could be controlled.

MOST EXPENSIVE PLACEBO

The most expensive placebo in current use is the vitamin tablet. While I would in no way attempt to derogate the therapeutic value of vitamins where definite indication exists for their use, I believe most firmly that an indication is present in less than one out of a hundred cases in which vitamins are prescribed.

—PAUL WILLIAMSON, M. D.
in *Canadian Medical Association Journal*,
p. 21, July 1954

THE U. S. S. BENNINGTON DISASTER

Handling and Initial Treatment of Casualties

JOHN L. ENYART, *Captain (MC) USN*

AT about 0630 on the morning of 26 May 1954, the U. S. S. *Bennington,* while conducting routine air operations in southern New England waters, sustained a serious explosion which involved the officers' wardroom and enlisted messing spaces on the second and third decks of the forward portion of the ship. Ninety-one persons were killed outright, 12 died later of injuries, and 203 were injured. Shortly after the explosion occurred, the commanding officer of the *Bennington* informed the commanding officer, Quonset Point, of the disaster and requested medical assistance. This report is an account of the handling and initial treatment of the casualties, and is presented as an object lesson for the management of possible disasters in the future.

THE DISASTER PLAN

The officer of the day at this hospital was informed by the operations officer at the Naval Air Station, Quonset Point, at 0740 on 26 May 1954 that an accident had occurred aboard the U. S. S. *Bennington,* and that 100 casualties, with 10 deaths, had been reported. The ship's position was given as 75 miles south of the Brenton Reef Lightship, and the expected arrival time at Quonset Point was 1230. The commanding officer was immediately informed and he gave instructions for the officer of the day to alert all chiefs of services and division heads for a conference to implement the hospital's disaster plan with such modifications as would be required to cope with the problem.

Additional information received raised the casualty figures to 250, and indicated that the majority of the patients would be burn casualties with some trauma. It was decided to evacuate patients from two surgical wards, one orthopedic ward, and one general medical ward in the main building of the hospital to the outlying pavilion wards. Postoperative surgical and nonambulatory orthopedic patients were to be consolidated in the remaining orthopedic ward in the main hospital building. The evacuated wards, with a capacity of about 200 beds, were to be prepared

From U. S. Naval Hospital, Newport, R. I.

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immediately for the reception of the burn casualties. After this decision, it was planned to treat the burned patients by the open method with emphasis on electrolytic balance of body fluids and shock treatment. The details of the treatment were outlined and explained to the assembled medical officers, who were then divided into teams and assigned to the casualty wards.

Stocks of material required for treatment of the casualties were reviewed and emergency supplies broken out for issue to the casualty wards. Immediate steps were taken to augment the supply of whole blood in the hospital's blood bank with blood from physically acceptable patient and staff donors. The chief of the nursing service made the necessary assignment of Nurse Corps personnel and arranged for procurement of nursing equipment and supplies. The personnel officer assigned additional personnel to the wards receiving casualties, the transportation section, and casualty receiving section, and made provision for first-aid parties to proceed to Quonset Point to accompany the casualties to this hospital. Measures were taken to control the flow of traffic within the hospital reservation, and public information release procedures were established.

TRANSPORTATION OF PATIENTS

For the most part, the steps taken coincided with the procedures outlined in the hospital's disaster plan. Certain modifications were made on the basis of information received concerning the type and manner of transportation of casualties. The original plan provided for the ship to proceed directly to its dock at Quonset Point and to arrive at about 1230. Small craft were to be dispatched by the naval base at Newport to be available for the transportation of casualties to Newport when the *Bennington* docked. A request was made by the commanding officer of the naval base at Newport for first-aid parties to accompany these craft, and assignments were made.

The suggestion was made for the ship to anchor in the channel opposite the hospital to permit the casualties to be evacuated by small boat to the hospital's boat landing. This would have resulted in a saving of about one hour and 40 minutes in arrival time at the hospital. Before the suggestion could be adopted, arrangements were made for the casualties to be airlifted by helicopter (fig. 1). Three landing points were designated at and near the hospital, to which ambulances were dispatched. The naval station made fire trucks available to stand by in the event of a landing casualty.

As the severity of the situation became apparent, it was obvious that additional personnel in all categories would be required. All available medical officers in the nearby forces

afloat were ordered to report to the hospital for assignment. Enlisted personnel were sent from destroyer tenders and from the naval station. The initial radio reports brought telephone calls from civilian doctors, nurses, and other civilians from the nearby communities. Civilian practitioners from Newport Hospital reported and were assigned to casualty wards. Civilian

Figure 1. U. S. S. Bennington *at the mouth of Narragansett Bay, underway to Quonset Point. Three helicopters are in the process of evacuating patients.*

nurses and nurses' aides were directed to the chief nurse, who made assignments. As the enlisted personnel reported aboard, they were screened for technical specialties and assigned to the various services where their training could be fully used.

THE PLAN IN OPERATION

At 1045 the first helicopter landed on the hospital reservation with two patients (fig. 2). From that time until 1345, the helicopters shuttled back and forth, carrying patients, supplies, and personnel, while the ship was proceeding to port. An adequate communication system was improvised through the use of radio-equipped shore patrol vehicles at the helicopter landing sites and at the hospital entrance. Sixty-four patients were brought from the ship by helicopter, and later 18 more were transported by boat from Quonset Point, making a total of 82 patients admitted. It is estimated that the innovation of the helicopter evacuation resulted in saving the lives of at least 40 percent of the total casualties admitted. This type of transportation also permitted a staggered admission procedure which made possible the thorough screening of the patients and their assignment to an appropriate ward, depending on the type and severity of the

injury. Because of its accessibility to the casualty wards, the front entrance of the hospital was substituted for the regularly designated triage station.

No attempt was made to procure admission data, other than to maintain a count of patients admitted, until the patients were placed in bed and treatment initiated. At that time, admission teams assigned to each ward completed the admission record, NavMed Form 1285, and the personnel office prepared a master

Figure 2. Helicopter landing with patients on dock in front of U. S. Naval Hospital, Newport, R. I.

casualty listing from data obtained. The Bureau of Naval Personnel directed this hospital to prepare daily progress reports for all casualties on the critically and seriously ill lists other than those whose next of kin came to this area.

Of the 82 casualties admitted, 16 were classified as critically ill and 25 as seriously ill. All patients were immediately placed under treatment upon admission to the casualty wards. Because the fleet and civilian physicians had not attended the staff conference outlining the method of treatment to be used, some minor difficulties were encountered at first. This situation was resolved and the treatment proceeded as originally planned.

The shock and burn treatment teams, each consisting of a doctor, a nurse, and two hospital corpsmen, continued to function as a unit throughout the first 24 hours following the admission of the patients. When the situation stabilized, duty sections consisting of six medical officers, four nurses and 12 hospital corpsmen were established on eight-hour watches for

each of the four wards. This routine continued in effect, with certain modifications, during the first 10 days. When the condition of the patients permitted, further screening was done to group the more serious cases in one ward and thus facilitate treatment and save personnel. The personnel requirements were gradually reduced until on 20 June routine duty assignments were re-established for all wards.

PROBLEM OF SUPPLIES

Shortages of supplies soon began to occur, particularly of sterile goods, syringes, intravenous sets and stands, rubber gloves, rubber sheets, arm boards, blood pressure apparatus, stethoscopes, drinking tubes, and instruments. The property officer and his assistants circulated throughout the wards continually during this period and relayed requirements to the procurement section. The medical supply section of the Naval Supply Depot at Newport had been alerted, and promptly processed telephonic requisitions. Some equipment and supplies were obtained from surrounding medical activities, including civilian hospitals. Clothes trees and metal mosquito bars were improvised for use as intravenous stands. Frames were made from ½-inch metal rods to serve as cradles to keep bed clothing from burned areas on the patients.

The shortages previously noted were directly concerned with the initial phase of the problem. Because the hospital's otherwise adequate supply system was not sufficient to provide for an emergency of such magnitude, supplies of some required items were exhausted during the first day, a few during the first two or three hours. The availability of additional supplies from the depot proved of inestimable value. The open purchase of supplies required for treatment of burns and secondary infections was complicated by the long holiday weekend because most commercial medical supply houses were closed. Furthermore, the usual local sources were unable to furnish the required material in the quantities desired. This required telegraphic orders to the main supplier or manufacturer. The main items in this category consisted of parenteral antibiotics and débriding agents, both nonstandard items. The procurement of six Stryker frames, urgently needed for this type of casualty, was accomplished within 72 hours through telephonic order to the manufacturer and air-freight delivery. The co-operation shown by all commercial suppliers during this period was excellent.

The staffing and equipping of a completely functioning radioisotope laboratory within four days of the disaster, for use in determining blood volume and extra cellular fluid volume, and for other studies in connection with the treatment of these casual-

ties, will be made a subject of a separate report. It is clear that the many logistic problems encountered were only surmounted through the exceptional hard work and the splendid co-operation of all personnel, commands, and civilian agencies.

HANDLING OF VISITORS

Because the influx of visiting relatives would create a problem, steps were taken to minimize it as much as possible. A reception room near the information desk was equipped with comfortable furniture and staffed by volunteer Red Cross Gray Ladies. Arrangements were made for two chaplains to be in constant attendance. General visiting on the casualty wards was not permitted. The immediate next of kin of patients on the seriously and critically ill lists were allowed brief visiting periods of from three to five minutes twice daily. Upon their first arrival at the hospital, relatives were met by a chaplain of their own faith. If visiting was permitted, the visitor was provided with a surgical gown and mask and accompanied to the ward by the chaplain. Where indicated or requested, an opportunity to consult with the medical officer in charge of the case was provided.

The Red Cross assisted the visitors in finding housing accommodations. Transportation was provided by the volunteer motor corps group. A section of the mess hall was assigned to those visitors who desired to purchase meals at the hospital, and a small canteen was set up in the Red Cross building to provide refreshments for the relatives without charge. The local chapter of the Navy Relief Society made their services available to these families and rendered required financial assistance. This phase progressed without unpleasant incident and the command was pleased to receive many appreciative comments from departing visitors for the consideration that they had received.

During this emergency the hospital staff was augmented by 66 enlisted personnel from shore activities and forces afloat. Twenty-nine medical officers reported for emergency temporary additional duty from nearby ships and naval hospitals. The research programs which assisted in the treatment of the casualties were staffed by five medical officers and eight enlisted technicians from other naval hospitals.

At this writing, of the 82 patients admitted on 26 May, 31 remain on the sick list. Twelve of these are presently on sick leave and will be returned to duty upon their return. Of the 41 patients whose condition was classified as critical or serious, three are still being carried on the seriously ill list, and 12 died of injuries received. Thirty-nine patients made a complete recovery and have been returned to duty.

CONCLUSIONS

From the experience herein reported it is possible to list the chief conclusions which may be drawn from the *Bennington* disaster. An efficient organization and disaster plan must be flexible and adaptable to the existing environmental conditions. The following factors are considered essential in over-all disaster planning:

1. Availability and proper use of additional specially trained personnel from other activities.

2. Use of available auxiliary personnel (Red Cross, Gray Ladies, Navy Relief, Girl Scouts, convalescent patients, and civilian employees) for nonprofessional duties.

3. Intensified instruction of lower-rated hospital corps personnel in casualty handling procedure and periodic disaster plan drills.

4. Instruction in casualty handling and evacuation by helicopter.

5. Availability of mobile radio equipment for maintaining essential communications.

6. Liasion of security force with civilian authorities in establishing traffic control measures.

7. Adequate provisions for reception, housing, transportation, and other assistance for visiting next-of-kin, under direction of chaplains, Red Cross, and Navy Relief.

8. When possible, preliminary command conferences to outline the details of casualty reception, triage, treatment, and necessary modification of the disaster plan, to meet requirements of the situation.

9. Designation of staff medical officers and staff nurses in a strictly supervisory capacity of the casualty wards to correlate activities, prevent the issuance of conflicting orders, and assure proper use of nonstaff personnel.

10. Use of wards that are most convenient to Central Supply, operating room, laboratory, x-ray, and diet kitchens, rather than outlying wards that are remote from essential facilities.

11. Screening of requests for special drugs, equipment, research requirements, and personnel through the executive officer in order to eliminate duplication and excess procurement.

12. Standarization of blood collecting and blood donor sets.

13. Early conferences daily to outline the clinical progress of patients and necessary changes in treatment plans. The attendance of the personnel, finance, and pharmacy officers is advisable to correlate planning.

14. Immediate availability of reserve medical supplies and equipment. This is an essential factor in any emergency or disaster planning. The curtailment of supply levels at medical activities requires a more realistic approach to the requirements for insurance-type items, as related to the accessibility of reserve stocks and to transportation difficulties under emergency conditions.

It is believed that these points, having been tested in an actual emergency situation, will be of interest to all those responsible for evolving and activating military or civilian disaster plans.

PAUL EHRLICH (1854-1954)

There are two kinds of great men in history: men of action, whose great deeds exercised an enlightening influence on their contemporaries and became a source of encouragement and inspiration for the generations to come; and men of thought, who handed their great knowledge down to posterity in their written word.

In the history of medicine, men of action were Boerhaave and Paré, who are remembered more for their personalities than for anything else; and men of thought were Avicenna and Vesalius, whose *Canon* and *Fabrica,* respectively, were of such importance that they almost eclipsed the men who penned them.

But there are also men who leave behind them both great actions and great written works, men who soar to towering heights leaving in their wake a glorious scar on the face of the earth. Such a man was Paul Ehrlich, of whom it can be said—to paraphrase what was said of Claude Bernard in connection with physiology—that he was not a chemotherapist but chemotherapy itself.

—FÉLIX MARTÍ-IBÁÑEZ, M. D.
in *International Record of Medicine and General Practice Clinics,* p. 143, Mar. 1954

ON-THE-JOB TRAINING OF ENLISTED MEN FOR PSYCHIATRIC WARD DUTY

MILTON H. MILLER, *First Lieutenant, USAF (MC)*

IN considering the special problems encountered in training medical enlisted men for work on a closed psychiatric ward, specific attention should be directed as well to the general problems which impede "job-training" in all departments of a hospital. Although the tasks of individual medical enlisted men differ from service to service, the widespread need for continued training and the tendency to slight this need are common to almost all hospital services. Also, certain similar interpersonal situations arise which prevent those who require further training from seeking it, and those who are in a position to teach from offering help.

HISTORICAL BACKGROUND

In the nine years following World War II, there has been a growing awareness of the contribution made by adequately trained and conscientious members of the nonmedical staff to the care of hospitalized patients. At times, that contribution is the decisive factor in determining whether a patient will recover from his illness. The comfort and rate of recovery of almost all hospitalized patients are in part dependent upon the caliber of care administered by the ward attendants, laboratory technicians, and other ancillary specialists. Hospital administrators know that the difference between hospitals with "good" and "bad" community reputations is frequently a difference in the attitude and manner of ward men, technicians, and admission desk clerks.

This growing interest in the role of medical enlisted men or aides has been especially marked in the psychiatric hospitals, both military and civilian. Prior to World War II, only a small number of mental hospitals had training programs for nonmedical employees. Today, there are few mental hospitals without psychiatric aide training programs. Menninger,[1] in describing his own experiences as manager of the new Veterans Administration Psychiatric Hospital in Topeka, Kans., said that: "It came as a startling surprise to me that, in sheer numbers of personnel, psychiatric aides *are* the hospital. Fifty percent, or nearly a thousand, of our new employees fell into one job category—psychiatric aides. I had thought of the psychiatric hospital as a

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place where doctors work, assisted by others; I began to think that it would be more appropriate to say that psychiatric hospitals are places where aides work, assisted by nurses and doctors."[1]

He described his concept of the importance of the psychiatric aide, saying "* * *that the aide—more than any other hospital employee—was in a position to exert a potent and continuous therapeutic influence on the patients in his charge. It is the aide who is with the patient from minute to minute and hour to hour, day after day and week after week, for month after month and even year after year. It is the aide who sits by the patient in lonely vigil, who works with him, plays with him, waits upon him, takes him to the toilet, gives him food, lights his cigarette, diverts his belligerency, shakes his hand when he enters the ward and when he leaves. It is not only by his number, but by virtue of the role he plays in the patient's recovery or otherwise, that the psychiatric aide is the essence of the large mental hospital."[1]

Menninger's observations are applicable as well to the enlisted men assigned to the psychiatric service in a military hospital. Because of the acute nature of many of the psychiatric disorders in the military hospital, the role of the enlisted man is of particular significance. Patients have not as yet settled into stereotyped behavior patterns, and exhibit frequent behavioral changes. Acute management problems, such as suicidal gestures, acute depression, or destructive hyperactivity occur frequently. The acutely ill psychiatric patient has an extreme need for humane and skilled care, and he is likely to be more responsive to such care than will the chronically disturbed patient.

The disproportionate amount of time expended by physician and corpsmen in direct patient contact is a prominent factor in determining the importance of the corpsmen's role in assisting the psychiatrist. While working as a resident physician, I cared for 25 closed-ward schizophrenic patients. For each hour I had available for direct patient contact, some 17 hours were spent by psychiatric aides in immediate association with the patients on the ward level. In my current ward assignment as an Air Force psychiatrist a similar ratio exists. Thus, only about six percent of the potential man-hours in the hospital milieu are contributed by the physician. Most hospital wards are without a physician, except for emergency situations, for 16 hours of each day. During this time, the care of the patient rests with the assigned enlisted personnel and the ward nurse. In the early predawn hours, the hazards of these "other 16 hours" are too often illustrated by a suicide on the psychiatric service, a Miller-Abbott tube dislodged on the surgical service, a femur refractured in an orthopedic patient, or a temperature of 105° F. ignored at the admission desk. Even without such dramatic events, the physician is confronted daily

with the importance of competent and efficient enlisted men in assuring his patient's well-being. Many medical treatments are merely prescribed by the physician. The conversion of a written sentence on an order sheet into an event involving the adequate treatment of patients requires the intervention of ward nurses and enlisted men. Unless the men on duty on all the shifts have the training and interest to understand and carry out the physician's order, the patient on "suicidal precautions," for example, may be presented instead with a "suicidal invitation." The same is true of patients on "bed rest," "routine postoperative care," or "limited dietary intake regimen." Even the patient who is receiving penicillin will require correct temperature readings. It is probable that many medical enlisted men performing even such relatively simple tasks as recording temperatures could benefit by practice under supervision.

Many kinds of training programs have been established to train psychiatric personnel. The range of curriculum, purposes, and period of operation of each have varied from hospital to hospital. One of the most ambitious and carefully documented of these training programs, carried out by the Menninger Foundation School for Psychiatric Aides, was reported on by Hall and associates[2] in 1952. This book contains a wealth of practical observations concerning psychiatric aide education. The authors stress the importance of clearly delineated training objectives, *i. e.*, that the curriculum must be specifically planned in terms of the activities for which it will prepare its graduates. They point out the great value of supervising the trainees' clinical work, and stress that "Learning is embedded in the interpersonal relationships which develop between the student and his supervisors and teachers."[2] Most authors agree that a training program which consists primarily of didactic lectures from teachers, who are at the same time strangers to the psychiatric aide, are of quite limited value.

The school at Brooke Army Medical Center, San Antonio, Tex., for training enlisted men as psychiatric aides, provides a period of three months' extensive study for Army and some Air Force personnel. After graduation, they are assigned to the psychiatric services in various Army and Air Force hospitals. These trained men bring skills and job understanding which make them potentially effective supervisors and ward leaders. Most military personnel, however, assigned to work on a psychiatric service do not have the benefit of extensive training, and most of what they need to know must be learned "on the job." This is true not only of psychiatric aides but of hospital employees on many services, in both civilian and military hospitals. The bulk of training provided for most hospital personnel must be integrated with everyday duty. If no specific guidance is provided "on the job," en-

listed men remain poorly trained, and frequently perform inadequately. For the physician to assume that because patients and medical enlisted men are placed together on the ward "the enlisted men will help the patients" is at best foolishly optimistic. If inadequately trained men are assigned to care for patients, enlisted man, patient, and physician alike will suffer the consequences.

THE MEDICAL ENLISTED MAN'S DILEMMA

The medical enlisted man assigned to the closed psychiatric ward will face a number of difficult problems. He will be locked in a ward with patients who are usually there because the symptoms of their illness were threatening to members of society. Unlike the physician and nurse, he cannot retire with ease to the security of a private office (frequently some distance from the ward). Neither can he assuage his anxiety by regarding symptomatology in the detached, "mental mechanistic" manner so reassuring to most psychiatrists. A threat is a threat and has nothing to do with "projective mechanism." The untrained man will waste, or use in a nontherapeutic manner, many of the hours available for patient contact. Patients with incipient schizophrenia, who desperately need attention and care, will be left to themselves, while the hospitalized alcoholic, drug addict, or gregarious psychopath will receive the bulk of personnel attention. If untrained men are assigned to a closed psychiatric ward, there will be many fights. Each will lead to new ones because enlisted men and patients will resent the way each is mishandled by the other. There will be many suicidal gestures, numerous missing pieces of silverware, repetitive interviews with complaining parents, and frequent inquiries from the hospital administrative staff. There will be a number of requests for transfer to other duty and, in the military situation, recurrent absence without leave. The harrassed and conscientious physician will be astonished and pained to learn that some members of the ward team believe that he "neglects patients." Often these medical enlisted men are really saying, "He neglects us."

The physician, too, will have serious complaints about the performance and attitude of the assigned medical enlisted men. He will use such expressions as "no desire to learn," "poor caliber," and "untrainable." He will ask the hospital administrative officer for "better men" for work on the ward. He will have as little to do with personnel on the ward as possible.

The most serious symptom of the unhealthy ward situation will be the failure of many patients to respond to treatment which the physician had hoped would lead to recovery.

THE PHYSICIAN'S ROLE

What is the responsibility of the physician with regard to such matters? Who is ultimately to be responsible for the caliber of training given to ward personnel? How active a role must the physician play in the matter of training psychiatric personnel?

For many reasons, the physician shares in the responsibility of seeing that his patients receive competent handling from all hospital employees. In many instances, only the physician is able to judge whether his medical enlisted men are adequately trained and whether they are providing good ward nursing care. Of equal importance is the fact that educational efforts on the ward level which are not wholeheartedly supported by the ward physician face overwhelming difficulties. Whether the physician himself assumes the task of training personnel or delegates part of this assignment to someone else (nurse, ward master, or noncommissioned officer in charge), the responsibility for the enlisted man's education rests with him.

REQUIREMENTS OF ON-THE-JOB TRAINING

A major condition for the success of any on-the-job training program for enlisted psychiatric aides is the physician's acknowledgement of the significance of the role played by nonmedical personnel in patient care. Without the physician's appreciation of their performance, all medical enlisted men, trained or untrained, are likely to work in a careless and indifferent manner. If the physician, by expressing interest and offering supervisory help, demonstrates his awareness of the contribution made by his personnel, they will respond with an increased measure of interest and devotion. The importance of job recognition as it influences the effectiveness of combat troops, factory workers, salesmen, and indeed, all of us, is widely known and frequently discussed. In the absence of recognition and approbation, a 40-hour week seems interminable. When a worker senses that his job is important, extra hours of duty seem to reinforce this concept. For the enlisted psychiatric aide, if approval for his efforts is to come at all, it must come from the physicians and nurses.

Another important condition is the establishment of adequate channels of communication between medical enlisted men and the physician. "Adequate communication" is a remarkably difficult problem in a hospital situation, probably impossible without such media as regularly held ward meetings attended by all who work on a given service or ward. The ward meeting of physician and enlisted men is the physician's tangible admission that he regards their work as important. His participation week after week in such meetings is more meaningful to personnel than any as-

surances he may utter about being a believer in "the team approach." Many times, important goals in training can be attained informally at such meetings, and it is here that the physician can best determine those areas on which a training program should bear particular emphasis. In the absence of this kind of meeting place, minor misunderstandings may assume great proportions. Should this occur, the patient must bear most of the consequences.

Methodological considerations stand lower in importance than the factors described above. Most persons learn best by doing. This is true in training enlisted psychiatric aides. The physician's unadorned statement, for example, that he is "opposed to the arm lock as a restraint method" is far less helpful than his supervision of the practice in proper restraint technics would be. Do I propose that the physician serve his patients by supervising practice in humane and safe restraint? Certainly.

Several publications of the National Association for Mental Health serve as excellent, readable introductions to the work of the enlisted psychiatric aide.[3, 4] In addition, an increasing number of excellent training films are available. In a military establishment, such films can usually be obtained with little difficulty through the training film library. The National Association for Mental Health also circulates a number of motion pictures on subjects of significance to those who care for the mentally ill.

In general, the methodological devices used in any form of hospital employee education will vary with the preferences of the instructor and the physical limitations of the hospital. While such factors are important, the success or failure of a training program for medical enlisted men is much more likely to depend upon the sense of mutual purpose and the kind of working relationship existing between the physician and the other persons who work on the ward.

CONCLUSIONS

The caliber of care given hospitalized psychiatric patients will depend in large measure upon the skill and interest of the enlisted men on the psychiatric service who care for them on a 24-hour basis. The physician must assume the final responsibility for the quality of attention administered to patients by his assistants. Many ward men assigned to care for psychiatric patients are in need of further training, and almost all will require the moral and professional leadership of the physician. To lead successfully, the physician must be aware of the importance of trained and enthusiastic personnel, and must communicate his awareness to his enlisted assistants. Whether the physician assumes responsibility for the specific training of enlisted men or delegates this task to someone else, the responsibility for the decision is his.

The emotional atmosphere which exists between the physician and ward personnel is of particular importance in the development and maintenance of any training program. In the therapeutic atmosphere created by a common purpose, adequate communication, and mutual recognition, there will be little difficulty in securing adequately trained and enthusiastic personnel.

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THE LAW OF FERMENTATION

Down through the ages alcoholism has been a problem; for we find, in the book of Genesis, that Noah became drunk after he had partaken of the juice of grapes. Alcoholism is still a problem in which society has been deeply concerned. Every conceivable means has been utilized to solve it, but never with success. Probably the reason for this failure has been that only the moral aspect has been the focal point. Society, ignorant and prejudiced, has permitted its emotions rather than understanding and scientific knowledge to govern the methods of solution.

Americans have tried legislation by enacting the prohibition statute of the 1920's. This law was repealed because it did not keep men and women from continuing to drink alcohol. I believe we forgot one basic fact—that alcoholic beverages have attained world wide use because they are derived from the fermentation of raw materials such as staple plants, foods, fruits, and cereals. The process of fermentation by which alcohol is formed occurs in nature and man has learned it, not invented it. Therefore, the voters can never hope to solve the alcoholic problem by legislative prohibition. People can never solve it until they succeed in repealing the law of fermentation; and since this law is part of life itself, they can never hope to write it off the books.

—LEO B. SEDLACEK, M. D.
in *Mississippi Valley Medical Journal,*
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THE MEDICAL OFFICER'S RESPONSIBILITY TO THE COMMAND

EUGENE R. HERING, *Captain (MC) USN*

WHEN a serviceman presents himself for medical assistance, the medical officer must be aware that he has two responsibilities: one to the patient and one to the command. Briefly stated, this second responsibility embraces the measures which the medical officer takes to maintain the effective fighting strength of the command.

It is not my purpose to discuss the first responsibility. The motivation that carried a physician through long, hard years of training to attain his degree still functions to assure that the patient's interests will be safeguarded. It is the second responsibility, of which many of our physicians appear to be completely unaware, that prompts this article. Nor do I wish to blame the individual medical officer for failure in this regard, because I do not think that this part of his approach to the service patient has ever been forcefully brought home to him.

MEDICAL OFFICER'S ROLE IN COMBAT

This responsibility is ever present, not only in the heat of battle when every man capable of carrying out his mission must be preserved until the fire fight dies down, but in the dispensary, sick bay, and hospital. It is in battle, however, that our responsibility to the command to maintain the effective fighting strength of the combat unit becomes of critical importance.

Churchill,[1] in his excellent series of "propositions" regarding the handling of battle casualties, emphasizes the responsibility that the medical officer must assume in accomplishing early return of the wounded to action. His discourse is concise and contains so much common sense that it should not escape being read in its entirety by all military medical officers. With his permission, however, I shall quote three statements which have a direct bearing on the question at hand:

"Only when a retrograde movement is in progress does evacuation become a mass movement of all wounded away from the combat zone. . . .

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"The combat soldier is the most valued component of a military force. When he is struck down by the enemy, the prime responsibility of the medical service is to restore him to his former position in the line of combat in the shortest possible time. Transport of lightly wounded soldiers to the rear depletes the strength of the fighting force by increasing the number of man-days lost and by lessening their motivation for return to combat."

In discussing the decision to evacuate the lightly wounded, he maintains that "Complete objectivity is required, as the summation of a number of these decisions may well determine the success or failure of the military undertaking."

It is only natural that the physician's sympathies are with the patient because he is by inclination, training, and peacetime experience concerned primarily with the patient's welfare. Such sympathies toward the fighting man who is fit to resume the battle, however, are misplaced. One has only to consider the youngster still up there on the hill, carrying on the fight. The patient we are considering—with a minor wound, injury, or illness, or minor psychiatric condition, who after treatment and rest can be returned—is a component of a fighting machine that has been organized and trained to carry a ridge or defend a hard-won position. The ever-shrinking numbers up in that frontline rifle platoon mean double duty and double jeopardy for those still engaged.

The physician may well say, "This is none of my concern, someone should send up replacements." But replacements are not always available, particularly during the stress of a major battle. Then too, a replacement, thrown into an outfit with which he has not grown up, who is not a plank owner in that "dirty, stinking, loyal platoon" so colorfully described by a Marine sergeant in Korea asking for return to his unit, cannot readily take the place of the veteran.

ANTIDOTE FOR FEAR

Fighting men are not inanimate objects. They must have something to give them courage to continue to deliver effective fire. Glass,[2] writing on the antidotes to combat fear, considers "group identification" as the greatest single factor. He stated: "The most important component in the psychosomatic defense against battle fear is the powerful support that can be obtained from the group or combat unit. This sustaining force, called group identification or group unity, refers to the emotional bond that develops among men who share common hardships and danger. It has been repeatedly demonstrated that positive group unity is the distinguishing characteristic of successful combat units who

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endure severe battle losses with a minimum of individual combat failures." The replacement does not have this bond of unit identity and, therefore, initially is not as valuable a fighting entity as the veteran we lose through indiscriminate evacuation.

Let us approach this matter from another angle. If the physician permits wholesale evacuation of minor casualties for any cause from his outfit, not only is he weakening that outfit by that many men, but the situation will rapidly deteriorate and "snowball" until a major problem exists. Consider the attitude of even the most dedicated fighting man still up on the line when he observes that other men are escaping the battle situation for something less than obviously incapacitating conditions. Make no mistake; while we like to wave the flag about our fighting men, only a small percentage are enduring the risk of imminent death by choice, and when they observe that there is an honorable way out through the medical service, who is to blame them for thinking themselves stupid in not seeking a like escape?

Lest one think that the foregoing is a slur on our fighting men, let me assure you that many of them can and have carried on even to their deaths from severe wounds because of their indomitable spirit. Further, it has been my privilege to serve with men who violently refused evacuation although suffering from wounds or conditions such as frostbite that merited their removal from combat. The point is that fighting men can and must endure more than the medical officer, unaware of his responsibility, realizes.

THE STIGMA OF AVOIDING COMBAT

Now consider the failure of responsibility from the standpoint of the patient himself. Once he has lost his unit identity by being evacuated further along the chain than his condition merits, he has lost much of his combat effectiveness, even if he is later returned. If he has escaped the battle situation for less than indicated reasons, he himself is well aware of it, and while he may excuse it on the grounds that the medical officer officially aided and condoned such escape, the stigma is still there. Particularly is this true in the borderline psychiatric or "combat fatigue" cases. Wholesale evacuation of this type of case actually has a most detrimental effect on the men involved, as pointed out by Glass, Mullens,[3] and by practically all other qualified observers. In other words, the sympathies of the physician who permits wholesale evacuation are not only misdirected, but actually harmful to the patient.

To carry out this responsibility to the command takes medical officers who are not only aware of the tremendous part they play

in combat unit effectiveness, but also medical facilities in close support for treating and holding the minor types of casualties for early return to the fighting front. Air evacuation, which has been our greatest adjunct to reduction of mortality since the advent of antibiotics and whole blood, must not be considered as an easy method of solving our problems in handling casualties. For the seriously wounded, it is frequently lifesaving; when overwhelming casualties occur, it is a godsend from the logistic standpoint; but if overenthusiastic advocates consider it the end-all of casualty handling, our avowed mission to maintain fighting strength by early return of the fighting man to duty is seriously compromised.

RESPONSIBILITY IN REAR ECHELONS

So far, I have confined the discussion of our responsibility as medical officers to combat situations, but only a limited number of our medical officers can have the privilege and gratification of administering to our fighting men in the proximity of combat. A large percentage of our medical personnel must operate dispensaries and hospitals, or be attached to combat units which are not engaged in actual contact with an enemy. These medical officers also have a responsibility which cannot be ignored. How many man-hours and days are lost through taking the easy way out by issuing light-duty chits or keeping the patient in the hospital another week to make the next duty list? True, a man must be fit for duty before he is officially returned to duty, but let us not use this as an excuse for wasting manpower beyond the absolute necessity. In one Marine division during a particularly trying period of combat, a casual company was organized to rehabilitate men who were scheduled for return to action, during which time they were given gradually increasing exercise, re-equipped, and reassigned so that when the medical officer declared them fit, not a moment's delay was encountered in getting them back to the desperate situation which the division was encountering at the time. Surely, if this can be done in a combat outfit under adverse circumstances, such a policy and organization can be set up under the more favorable circumstance of relative peace.

In regard to sick call in the dispensary or sick bay, the practice of issuing "light-duty" or "no-duty" chits indiscriminately by the inexperienced or inefficient medical officer is a classic example of failure of responsibility. In the borderline cases between those obviously fit and those obviously unfit for duty, the medical officer must be even more zealous and thorough lest his office become the means of shirking maneuvers, hikes, or everyday routine of duty. A firm attitude on the part of the unit

medical officer will also pay dividends in a decreased sick call attendance, once the word gets around that "riding the sick book" is no longer tolerated.

THE BASIC OBJECTIVE

I am prompted to write on this subject because I sincerely believe that we have strayed from our objectives. The motto of the Navy Medical Department is "To keep as many men at as many guns as many days as possible." The Army states its aim more concisely: "To conserve fighting strength," and the Air Force: "Keep 'em Flying." These are not hollow phrases; let us reaffirm them in our daily handling of patients under all circumstances.

We are told that in any future conflict our greatest weakness will be relative lack of manpower. To overcome this lack, we must rely on providing each serviceman with a higher degree of training and skill. Such men are not produced overnight, and the loss of one of them is more severely felt by us than is the loss by the enemy of 10 of our "human wave" adversaries. We must therefore rely on the finest of medical care, dedicated to maintaining effective fighting strength. The commanders who carry the heavy responsibility for the performance of our armed services have a right to expect that we as medical officers share that responsibility.

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Students of medicine cannot be selected on the basis of academic grades alone. Important as academic ability is, character, emotional stability, ability to guide and help other people, and intellectual curiosity are no less, or even more, important. I believe that these are the factors which admissions committees take into account and that the reports of discrimination based on racial or other such reasons are usually completely erroneous and, at the worst, are greatly exaggerated. If the time should come when students of medicine are selected solely on the basis of grades, medicine and the public will suffer.

—From Editorial
in *Journal of the Florida Medical Association,* pp. 49-50, July 1954

An Unusual Retrorectal Tumor

BYRON V. WHITNEY, *Lieutenant (MC) USNR*

AN accurate preoperative diagnosis of retrorectal hemangioendothelioma is difficult to make. In considering retrorectal tumors, one must include in the differential diagnosis (1) congenital conditions (ectopic pelvic kidneys, meningocele, teratoma, and chordoma); (2) neurogenic tumors (neurofibroma, ependymoma, neurilemmoma, ganglioneuroma, and ependymal glioma); (3) osseous tumors (osteogenic sarcoma, chondroma and osteochondroma, Ewing's tumor, and giant cell tumor); (4) vascular and lymphatic tumors (hemangioendothelioma, hemangiopericytoma, lymphangioma, Hodgkin's granuloma, and lymphosarcoma); (5) soft tissue tumors (lipoma, myoma, fibroma, fibrosarcoma, and rhabdomyosarcoma); (6) inflammatory tumors (chronic infections from rectal fistulas); and (7) metastatic tumors.[1-3]

The incidence of retrorectal tumors is low. According to the Mayo Clinic statistics for a period from 1922 to 1936, they occurred only once in 40,000 admissions.[2] From among 32,860 surgical specimens seen at this hospital from 1947 to 1953, only one retrorectal tumor, a hemangioendothelioma, was reported. In this group of 32,860 cases, there were eight other hemangioendotheliomas and two hemangiopericytomas located in various parts of the body.

Hemangioendothelioma is a rare tumor to be found anywhere in the body. At the Bellevue Hospital only eight cases were collected in 22 years.[4] Wise,[5] Bacon and associates,[6] and Forman and Campbell[7] each reported a single case of a retroperitoneal pelvic hemangiopericytoma. Jackman and associates[1] reported two cases of retroperitoneal pelvic hemangioendothelioma. Both occurred in young patients, one three years old, the other 15 years old.

The symptoms presented by a retrorectal tumor may be minimal, depending on the size, origin, and location of the tumor in the pelvic cavity, and on the degree of bone erosion and of involvement of the sacral nerves. Low back pain, unilateral or bilateral radiating leg pain with paresthesias and weakness, rectal pain,

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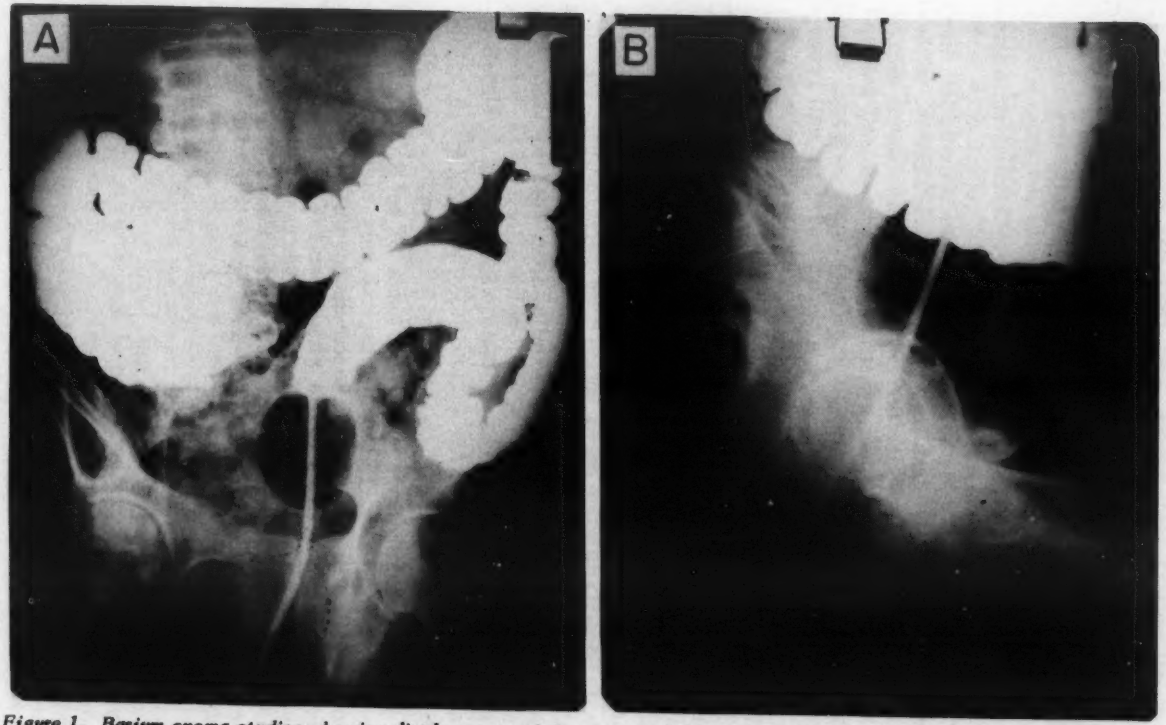

Figure 1. Barium enema studies showing displacement of the rectum. (A) Anteroposterior and (B) lateral views. Balloon is normally located in area of dotted lines.

constipation, urinary incontinence, and difficulty in voiding may be present.

The diagnosis of a retrorectal tumor is made by rectal digital examination. An impression may be obtained as to the type of tumor present by its consistency, attachments, location, and by the further diagnostic studies. Final diagnosis, however, always rests with the pathologist. Other required diagnostic studies are: (1) pelvic examination, to rule out associated genital pathology; (2) proctoscopic and sigmoidoscopic examinations, to rule out inflammatory lesions and rectal tumors; (3) roentgenograms of pelvis, to determine if bone erosion or primary bone tumor is present; (4) retrograde pyelogram, to determine the position of the kidneys and displacement of ureters; and (5) barium enema, to determine the condition of the colon and the amount of displacement of the rectosigmoid, thus giving some indication of the size of the tumor.

The development and pathology of vascular tumors has been described by Andervont,[8] Stout and associates,[9-14] and Pulford.[15]

Early diagnosis and radical operation are essential to the eradication of an hemangioendothelioma. Radiation treatment[16-18] has been proved to be only palliative. Postoperative irradiation should be advised for the patient when complete surgical removal of the neoplasm is in doubt.

CASE REPORT

The patient, an 81-year-old man, first consulted a physician because of dysuria of two days' duration. He had had nocturia two times for several years but denied any frequency during waking hours. Increasing constipation had been present for two years, necessitating a laxative every night. One year previously the patient had right sciatic neuritis, lasting for three months and followed by weakness of the right leg. There was no weight loss. The family history revealed a high incidence of malignancy; a brother had had carcinoma of the sigmoid and died at 75 years of age, and a sister had had carcinoma of the breast and died at 69 years of age. His other sister, 78 years old, was living and well.

Physical examination revealed a well-preserved man who appeared no older than 60 years of age and who was apparently in good health. His head, eyes, ears, nose, and throat were essentially normal. His weight was 165 pounds. Percussion did not reveal an enlarged heart, and the rhythm was regular. There was a systolic grade I murmur at the apex. Blood pressure was 160/80. The lungs were normal. The patient had a left direct inguinal hernia supported by a truss, and a two-finger-sized

Figure 1. Barium enema studies showing displacement of the rectum. (A) Anteroposterior and (B) lateral views. Balloon is normally located in area of dotted lines.

umbilical hernia. The liver and spleen were not palpable, and no masses could be palpated in the abdomen. The genitalia were normal. Rectal digital examination revealed the prostate to be hard, twice normal size, and regular. At the end of the examining finger posterior to the rectum was a grapefruit-sized mass which seemed to be outside the rectal wall. The mass was hard and

Figure 2. Anteroposterior view of retrograde pyelogram showing displacement of right ureter.

not movable. The right knee jerk and ankle jerk were slightly diminished as compared with the left. There was slight decreased muscular strength of the right leg as compared with the left but no muscular atrophy was apparent.

The laboratory studies, including a complete blood count; erythrocyte sedimentation rate; Kahn, Hinton, and acid phosphatase tests; urine and stool examination; and electrocardiogram were essentially within normal limits.

Proctoscopy and sigmoidoscopy revealed the rectum to be pushed anteriorly and to the left by a hard mass which was located outside of the rectum and which did not penetrate the rectal mucosa. The sigmoidoscope was passed its entire length and no other abnormalities were visible.

A roentgenogram of the chest was negative with no enlargement of the heart or aortic abnormality apparent. A barium enema revealed diverticulosis of the descending colon and sigmoid. A large mass visible in the pelvis was displacing the rectum anteriorly and cephalad a considerable distance. The bones of the pelvis ap-

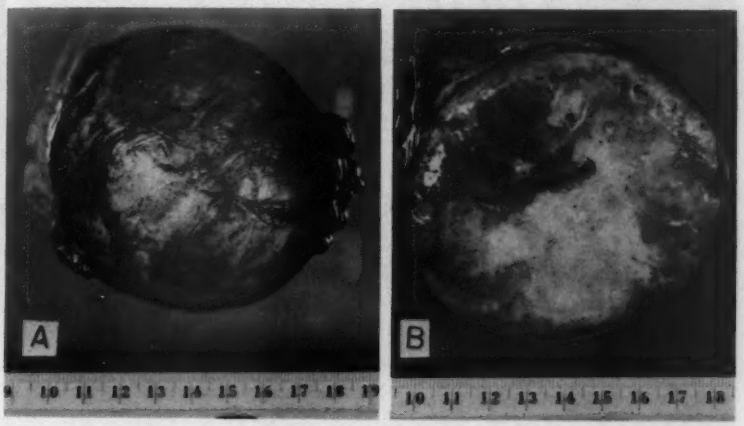

Figure 3. (A) Tumor showing the broader pedicle of attachment to the rectum and the smaller pedicle that was attached to the presacral tissue. (B) Cross section reveals hemorrhagic areas and capsule.

peared to be normal (fig. 1). An intravenous pyelogram was unsatisfactory, but a retrograde pyelogram providing adequate visualization of the kidneys and ureters showed no evidence of ureteral obstruction; however, the right ureter was displaced to the left in its distal third (fig. 2).

The preoperative diagnosis was retrorectal tumor, probably malignant, possibly a sarcoma. The abdominal route was chosen because of the size of the tumor and the apparent attachment to the right ureter. A midline suprapubic incision extending from the pubis to a point above the umbilicus was made. The umbilicus was removed, with repair of the umbilical hernia, in closing the the abdomen. The rectum, sigmoid, and bladder were found to be pushed anteriorly and cephalad by a grapefruit-sized mass located in the floor of the pelvis, posterior to the rectum. The lateral peritoneal attachment of the sigmoid was incised and carried downward and across the rectum below the brim of the

pelvis. By careful dissection the sigmoid was freed sufficiently so that it could be retracted medially. Both the right and left ureters were identified. It was then possible to reach the tumor and by manual dissection to free it from its attachment to the sacrum posteriorly and the rectum anteriorly. The tumor was delivered and sent to pathology for frozen section. It was reported to be not malignant. Considerable bleeding was encountered while removing the tumor, but this was remedied by whole blood transfusion. All bleeding was adequately stopped with ligatures, and the field was dry prior to closing the posterior layer of the peritoneum.

The patient did well postoperatively. Sigmoidoscopy on the eleventh postoperative day revealed the rectal mucosa to be intact, and he was discharged from the hospital on the thirteenth postoperative day. During the succeeding 18 months there has been no evidence of recurrence of the tumor.

The tumor measured 10.5 by 8 by 7 centimeters. It was encapsulated, but was attached to the surrounding tissues by multiple fibrous adhesions. An anterior and posterior pedicle marked its

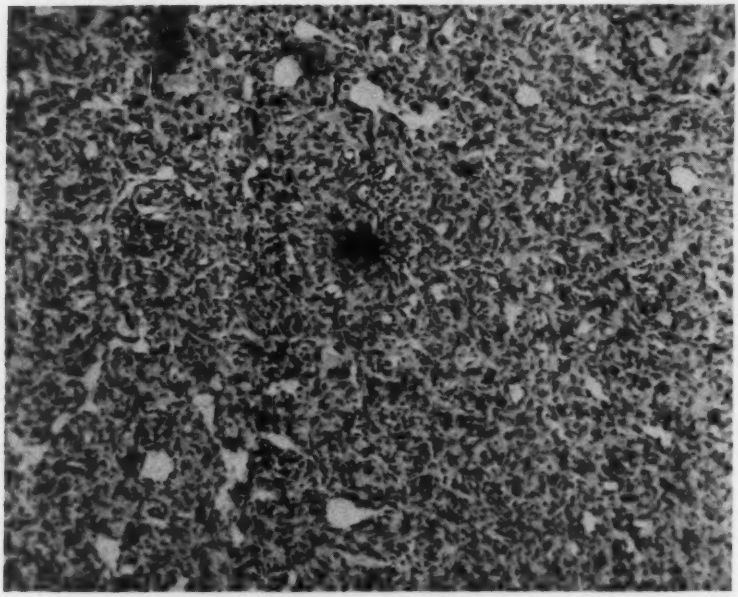

Figure 4. Photomicrograph showing numerous small blood vessels lined by a single layer of endothelium. In addition there are many endothelial cells which tend to arrange themselves in a circular fashion about the blood vessels. (Hematoxylin and eosin stain, x 100)

firm attachment to the rectum and presacral tissue (fig. 3). Microscopic examination showed elongated cells closely applied around the endothelial lining cells of the capillaries. There was

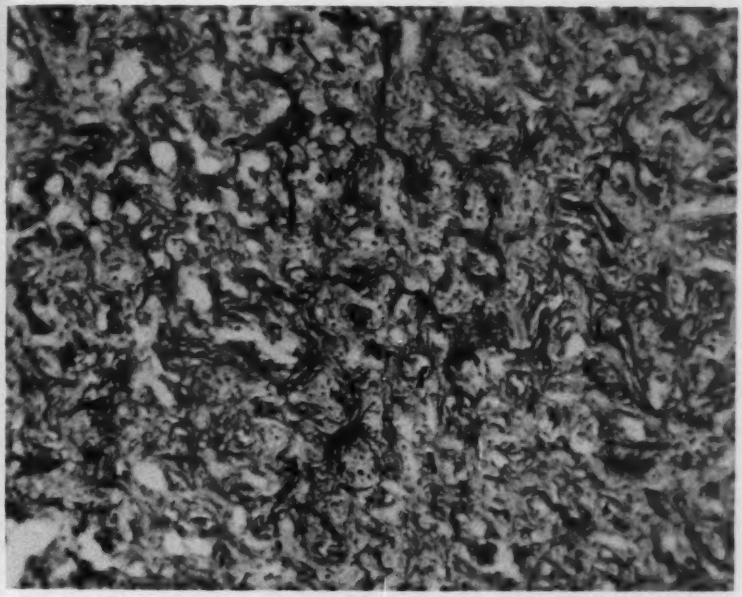

Figure 5. Photomicrograph showing fibrous sheath of blood vessels and endothelial cells within the fibrous sheath. (Silver reticulin stain, x 100)

a fibrous framework around the blood vessels and the endothelial cells were located within the fibrous layer. Most of the vessels had little or no reticulin in their fibrous sheaths (figs. 4 and 5). Dr. A. P. Stout reviewed the slides on this case and stated it was an hemangioendothelioma.

SUMMARY

A patient with retrorectal hemangioendothelioma presented a diagnostic problem until tissue was examined microscopically. Although this type of tumor is usually malignant, there was a two-year history of its presence, it was well-encapsulated, and the prognosis should be good.

Early diagnosis and radical surgical excision are paramount for a cure; radiation treatment is only palliative.

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THE TREATMENT OF CANCER

Surgical operations dealing with cancer are giving gratifying results provided the disease is localized and accessible and a diagnosis has been made early. The development of surgical technic, improvements in anesthesia, as well as in both preoperative and postoperative care, have made possible very radical procedures which, happily, not infrequently result in cure. Surgeons, however, should not be tempted to undertake the impossible or, indeed, as a result of their efforts leave the patient in such a condition that life is well-nigh intolerable. The age, the general condition, and even the temperament of the individual should be considered before undertaking treatment, for in some cases a disability such as the loss of the larynx or a permanent colostomy would not be borne. Very radical surgical operations should be confined to those cases in which there is a hope of cure. Otherwise, palliative measures only would seem to be justified.

—HAROLD WOOKEY, M. D.
in *A. M. A. Archives of Surgery*
p. 591, May 1954

Acute Myocardial Infarction Occurring in Flight at 12,000 Feet

JOHN E. SCHULTS, *Captain, USAFR (MC)*
H. R. ANDERSON, *Captain, USAFR (MC)*

TRAVELING by aircraft has become so increasingly common that it is today the preferred method of transporting ill and wounded patients.[1] Despite its frequent use there have been few reports of acute medical emergencies occurring in flight.

The importance of hypoxia has been recognized since 1875, when the balloon *Zenith*, carrying Tissandier and two companions, ascended to 28,820 feet near Paris. Tissandier alone recovered from the severe hypoxia that afflicted all three. In 1941 Graybiel[2] reported three deaths in flight and five additional deaths shortly after landing among seven million passengers carried by commercial airlines. The three deaths aloft, one at 3,000 feet, one at 12,000 feet, and the other at an unknown altitude, as well as two of those occurring immediately following landing, were attributed to heart disease.

White[3] and Benson[4] reported myocardial infarctions aloft in two young pilots which terminated fatally soon after landing. Graybiel and McFarland[5] reported a similar instance with survival of the pilot. Commercial air travel, however, is generally regarded as a safe method of transporting the patient with a heart disease when proper precautions are taken to prevent hypoxia during flight.[6] Marquardt and associates[7] reported that during World War II patients with myocardial infarction, in all stages of recovery, were evacuated by air transportation without incident.

In addition to infarction of the myocardium such serious pathologic entities as hemorrhagic retinitis,[8] spontaneous pneumothorax,[9] air embolism,[10] and subarachnoid hemorrhage[11] have been associated with flight. It is interesting to note that both cases of hemorrhagic retinitis occurred in patients with increased blood pressure.

There are reports of similar mishaps in pressure chambers simulating high altitude flight. Hammonds[12] reported the death of a student gunner due to myocardial infarction 12 hours follow-

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ing a simulated flight to 38,000 feet. Some of the more important problems of adaptation of the human organism to the physiologic stress of flying have been summarized by Grant.[12]

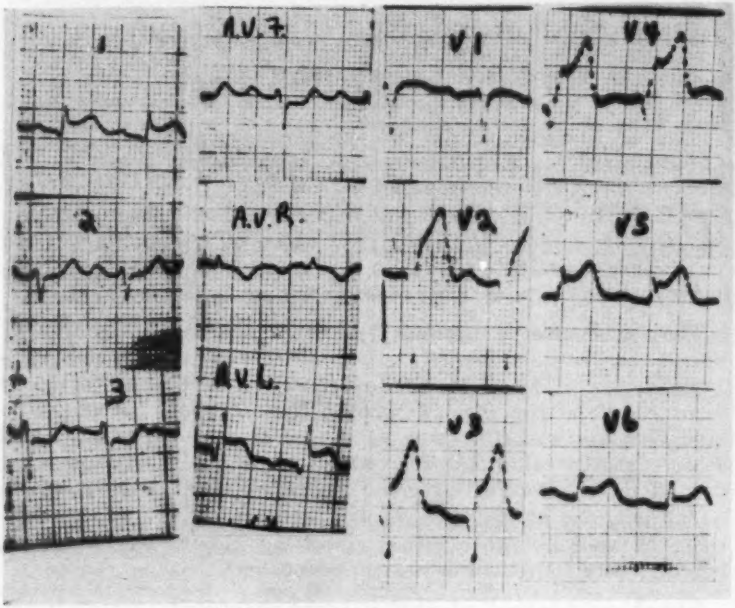

Figure 1. Electrocardiogram on 21 November 1952 showed elevation of the S-T segment in aV_L, Lead I, V_4, V_5, and slight elevation in V_6 and V_2.

The case of a young pilot who sustained an acute anterior myocardial infarction while flying at 12,000 feet without oxygen in an unpressurized military plane, and who made a satisfactory recovery from the acute attack is reported.

CASE REPORT

A 33-year-old pilot was admitted to this hospital on 21 November 1952. On a flight in a C-47 type aircraft from a distant base in Georgia, the patient and his copilot decided because of unfavorable weather to increase their altitude to between 9,000 to 11,000 feet for about two hours. During the last 30 minutes of this flight they were at an altitude of 12,000 feet. The aircraft was not equipped with breathing oxygen and was unpressurized, because they had not anticipated flying above 7,000 to 8,000 feet. The patient was seized suddenly with severe, oppressive, precordial pain which radiated into the left shoulder and down the left arm Because of nausea, a cold sweat, and shortness of

breath, he turned the controls over to the copilot who landed at this base, 20 minutes after the onset of the severe pain.

The patient stated that he had been in good health previously, but that his blood pressure was just under the upper limit of acceptability for military pilots (140 systolic, 90 diastolic) several months before when he received an annual physical examination. This was the only cardiovascular abnormality reported prior to his admission to this hospital.

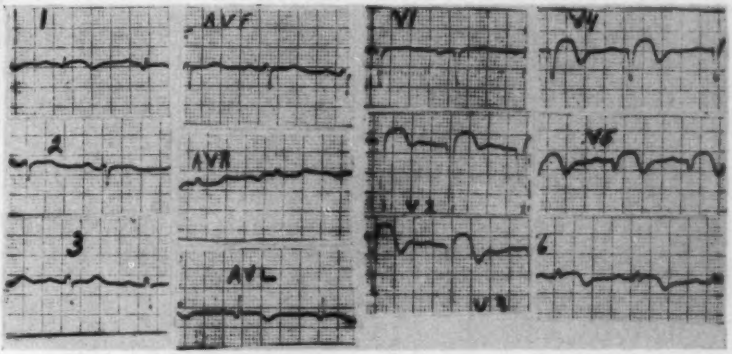

Figure 2. Electrocardiogram on 29 November 1952 revealed progressive inversion of the T wave in V_2, V_3, V_4, and V_5 with associated deep coving of the S-T segment and deep inversion of the T waves.

On admission to the hospital, the patient's blood pressure was 128/100 and his pulse, 120. He appeared pale, apprehensive, short of breath, and in acute distress from the persistent chest pain. He was at once placed in an oxygen tent and given morphine. The cardiac sounds were poor in quality and sounded distant. The heart did not appear enlarged to physical examination and there were no murmurs present. The second heart sounds heard over the aortic and pulmonic areas were equal. No gallop or rub was heard. The lungs were clear to auscultation and percussion. The physical examination was otherwise negative.

An electrocardiogram taken on admission (fig. 1) showed elevation of the S-T segment in aV_L, Lead I, V_4, V_5, and slight elevation in V_6 and V_3. There was a sinus tachycardia at 100; the P-R interval and QRS interval were normal. A diagnosis of acute anterior myocardial infarction was thus confirmed and the patient was treated with bed rest and moderate sodium restriction. Serial electrocardiograms revealed progressive inversion of the T wave in V_2, V_3, V_4, and V_5 with associated deep coving of the S-T segment and deep inversion of the T-waves which changes were interpreted as compatible with the evolutionary changes of an anterior myocardial infarction (fig. 2).

During the days immediately following his admission, his temperature increased to 102° F. and the white blood cell count and sedimentation rate, which previously had been within normal limits, rose with the onset of fever. These findings were interpreted as further indications of degenerating myocardium, but he showed no evidence of decompensation or arrhythmia. He was treated without anticoagulant therapy and responded satisfactorily. No evidence of renal disease or other primary cause for the previous hypertension was discovered during the hospital stay. His blood pressure was 100/60 at the end of his hospitalization, and his cardiac reserve was considered good. Following discharge from the hospital on 6 January 1953, he was permanently suspended from flying duties.

DISCUSSION

Blood arterial oxygen saturation progressively diminished with altitude according to Henson and associates.[14]

Feet	*Percent*
Sea level	96
8,000	89
12,000	84.9
15,000	74.4
18,000	71
20,000	70.8

It is generally believed that hypoxia may be present at 8,000 feet with definite impairment of night vision. At higher altitudes the physiologic effects of hypoxia are more pronounced.

The human organism adapts to hypoxia by an increased respiratory rate with resultant decrease in arterial pCO_2, a temporary alkalosis, and an increase in the oxygen carrying capacity of the blood.[15] There is an increase in cardiac output and heart rate, but a decrease in circulation time. In the electrocardiogram the T waves are flattened, the QRS complex is decreased in amplitude, and there is depression of S-T segment. There is also an increase in electric systole with prolongation of Q-T interval despite an increase in pulse rate.[16] Schneider and Truesdell[17] have shown that with hypoxia there is an elevation of the systolic blood pressure and fall in the diastolic pressure. They also found that persons with labile blood pressure were more likely to experience vascular collapse under the stress of severe hypoxia. This may have been a factor in the case reported.

Kreienberg and Winter[18] discussed in some detail the blood pressure response of normotensive and hypotensive subjects to

hypoxia and showed that their cardiovascular systems made adequate adjustment. They report that those who have hypertension secondary to renal or other diseases make a poor cardiovascular adjustment to increasing hypoxia, often experiencing vascular collapse at altitudes tolerated by normal persons.

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Pulmonary Arteriovenous Fistula

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PULMONARY arteriovenous fistula is a rare lesion, occurring in only three of 15,000 consecutive autopsies at Johns Hopkins Hospital.[1] It has been observed from birth to old age, but is found usually in the third and fourth decades of life.

The following case is reported by us because of favorable response to surgical treatment.

CASE REPORT

A 23-year-old marine was sent to this hospital for further study when cyanosis and clubbing of his fingers and toes were noted while he was being processed for separation from service. The patient is said to have been cyanotic since birth but at no time were any cardiovascular symptoms noted. His activity had never been restricted; he had even served a 12-month tour of duty with the marines in Korea. No increase in cyanosis or clubbing of the digits had been noted in the past 10 years. About five months prior to admission to this hospital, the patient developed nosebleeds and had had four such episodes for a few minutes every three or four days.

During the patient's childhood, the question of heart disease was raised by his family physician on numerous occasions, but none could be found. The patient never had any serious illnesses or operations.

On physical examination, the patient appeared healthy except for the cyanosis of his skin and mucous membranes. The conjunctivas were injected and pink. The fundi were normal. The face and neck appeared to be bloated or edematous, and multiple small hemangiomas were scattered over the trunk. The trachea was in midline. The chest cage expanded symmetrically and the lungs were resonant and clear to percussion and auscultation. A questionable murmur, which sounded like a grade I type of blow with replacement of the second heart sound, was audible in the left lower lung field posteriorly. The heart was not enlarged to percussion and no cardiac murmurs were audible. The aortic second sound was louder than the pulmonic. No masses or tenderness were present on abdominal examination. Peri-

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stalsis was normal. Neurologic examination revealed no abnormal reflexes. There was cyanosis and marked clubbing of the terminal phalanges of the fingers and toes. The peripheral

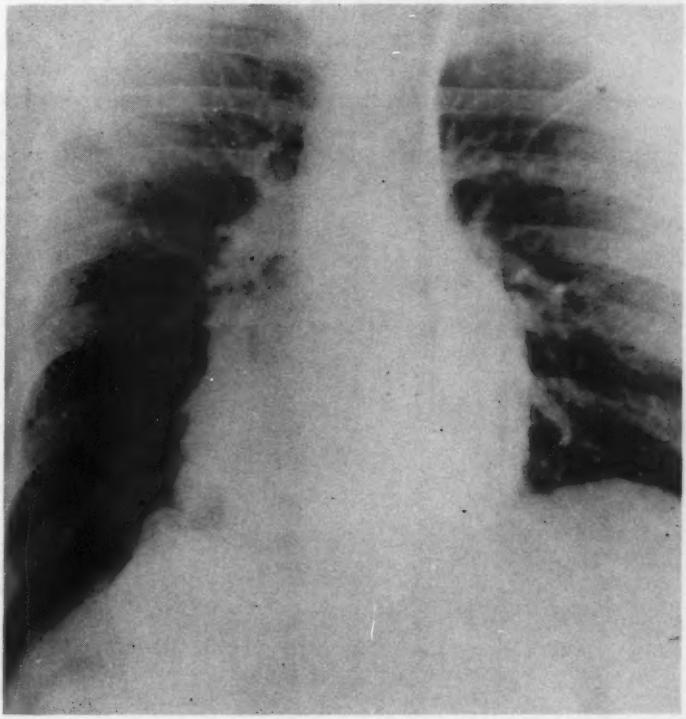

Figure 1. Angiocardiogram showing an arteriovenous fistula in the left lower lobe of the lung.

pulses were of good quality. Blood pressure in the right arm was 100/70, and in the left arm, 95/60. Blood pressure in the right calf was 110/80, and in the left calf, 110/80.

The red blood cell count was 7,400,000; hemoglobin, 115 percent or 18.2 grams per 100 cc.; hematocrit, 58; white blood cell count, 6,600, with 4,480,000 platelets, 71 polymorphonucleocytes, 28 lymphocytes, and 1 eosinophil. Urinalysis was negative with no albumin. Venous pressure was 120 mm. Hg; circulation time from arm to tongue with sodium dehydrocholate (decholin) was 14 seconds, and arm to lung with saline solution and ether, 9 seconds; bleeding time was 2 minutes 15 seconds, and coagulation time, 4 minutes 45 seconds. A roentgenogram of the chest showed a cylindrical homogeneous density in the left

TABLE 1. *Preoperative and postoperative gradient studies*

	Preoperative			Postoperative	
	Room air—Rest	High O_2—Rest	Room air—Exercise	Room air—Rest	Room air—Exercise
Arterial blood studies					
CO_2 content	39.41 vol. percent	37.00 vol. percent	36.53 vol. percent	45.98 vol. percent	45.49 vol. percent
O_2 content	23.23 vol. percent	23.54 vol. percent	22.02 vol. percent	20.76 vol. percent	20.19 vol. percent
O_2 capacity	27.84 vol. percent	27.84 vol. percent	27.84 vol. percent	21.58 vol. percent	22.21 vol. percent
O_2 saturation	84.5 percent	85.6 percent	80.0 percent	97.9 percent	92.4 percent
pCO_2	42.5 mm. Hg	40.2 mm. Hg	42.1 mm. Hg	34.9 mm. Hg	32.5 mm. Hg
pO_2	40.9 mm. Hg	44.0 mm. Hg	30.3 mm. Hg	93.6 mm. Hg	75.6 mm. Hg
Oxygen consumption	333 cc./min.	322 cc./min.	360 cc./min.	300 cc./min.	1210 cc./min.
Respiratory quotient	0.72	0.66	0.79	0.95	0.92
A-A gradient	53.0 mm. Hg	68.1 mm. Hg	68.2 mm. Hg	20.7 mm. Hg	40.3 mm. Hg

lower lobe from the hilum to the diaphragm suggestive of an arteriovenous fistula. Angiocardiography revealed an arteriovenous fistula in the left lower lobe (fig. 1). Oximeter readings showed 70 percent oxygen saturation with no change on 100 percent oxygen. An electrocardiogram demonstrated minimal left ventricular hypertrophy. Preoperative gradient studies are shown in table 1.

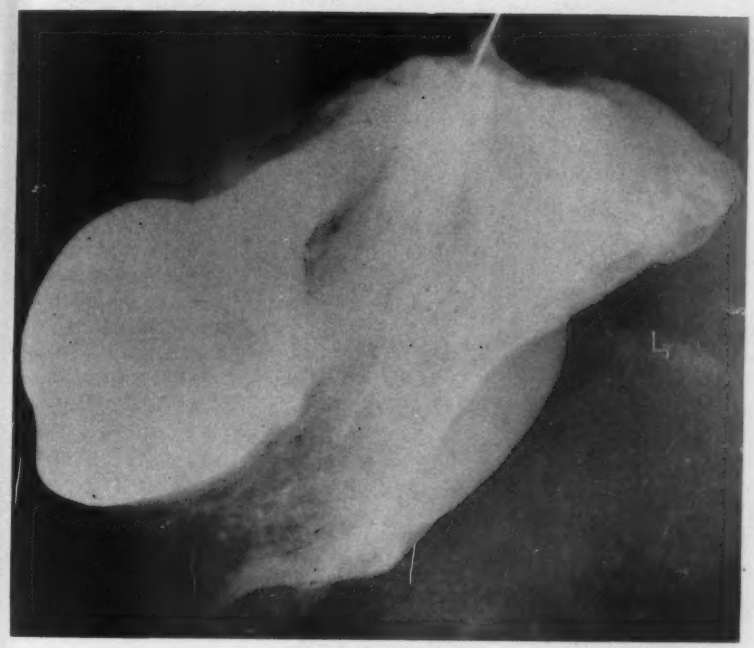

Figure 2. Roentgenogram of resected specimen showing pulmonary artery, pulmonary vein, and cavernous communicating sac outlined by diodrast.

On 22 September 1953, under endotracheal ether pentothal, nitrous oxide, and curare anesthesia, a left exploratory thoracotomy was performed. The chest was entered through the bed of the sixth rib. Examination of the vascular anomaly in the left lower lobe revealed an enormously dilated pulmonary artery and vein which joined a large, very thin-walled sac, within which the blood could be observed circulating. A left lower lobectomy was performed, thereby extirpating the lesion (figs. 2 and 3). No other lesion was found. Oxygen saturation by oximeter rose from 71 percent to 96 percent when the pulmonary artery to the left lower lobe was occluded. Postoperative gradient studies are shown in table 1.

After 30 days' leave, the patient was discharged to full duty. On 11 December he was readmitted for repair of a left inguinal hernia. At that time he was free of symptoms; there was no cya-

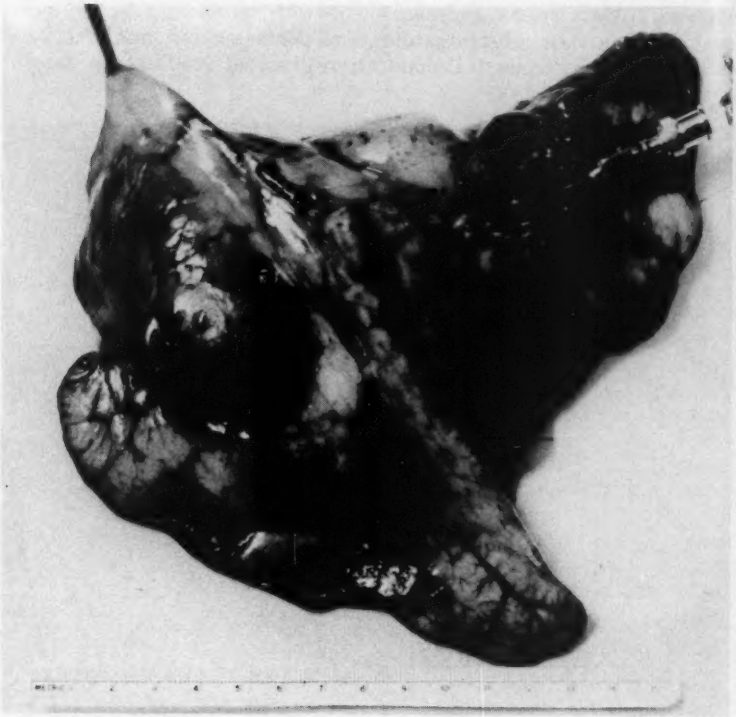

Figure 3. Resected specimen showing left lower lobe of lung with arteriovenous fistula.

nosis, and the clubbing of his fingers was noticeably less when compared with photographs taken on his first admission to the hospital. The red blood cell count was 4,480,000, and hemoglobin was 16.4 grams (103.7 percent).

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Hypnosis in Neuromuscular Re-Education

EDWARD B. SHIRES, *Lieutenant Colonel, MC, USA*
JOSEPH J. PETERS, M. D.
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THE advantages of hypnosis in neuromuscular re-education, as far as we know, have not been previously reported. The idea for this experiment was an outgrowth of the hypothesis that in the first few years of life voluntary muscles may be bilaterally innervated, whereas it is only later that the contralateral corticospinal tracts take over voluntary function. There are suggestions in the literature which support this hypothesis, particularly in reports of animal experimentation.[1] Penfield and Rasmussen[2] presented several cases in humans in which there was evidence of ipsilateral innervation of muscles as shown by electrical stimulation of the cerebral cortex. Because there are cases of muscular paralysis, such as hemiplegia, due to the interruption of contralateral fibers in the brain, it was proposed to regain motion by re-establishing function of the inactive ipsilateral tracts. To accomplish this, it would be necessary to regress the patient to an early age. Thus the use of hypnosis was proposed. A relatively young patient was chosen in order to facilitate the induction of hypnosis and to reduce the number of years away from that age when voluntary muscles were presumably bilaterally controlled. This technic was used previously in two patients, with equivocal results.[3]

CASE REPORT

The patient was a 30-year-old, left-handed woman who was admitted to this hospital with pulmonary tuberculosis. She was first seen by the physical medicine service on 18 January 1952, at which time routine prethoracotomy exercises were prescribed. On 31 January, a left upper lobectomy was performed. On 11 February, a flaccid left hemiplegia developed suddenly as she awakened from a nap, presumably due to a cerebral embolus in the right internal capsule, the source of which was never definitely determined. There was no evidence of thrombophlebitis. It was thought that, although the time interval was atypical, the source of the embolus was probably the stump of the resected lobe. At the onset the deep tendon reflexes on the left could not be obtained, but within the next 24 to 48 hours the

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classical findings of hyperactive deep tendon reflexes, absent abdominal reflexes, and Babinski sign developed on the left side. There was mild dysarthria, exhibited as a slurring, but there was no aphasia. No spasticity was noted. Gross muscle testing on 15 February revealed a moderate left facial weakness of the upper motor neuron type and marked weakness to complete paralysis of all musculature of the left upper and lower extremities. Passive joint range of motion was within normal limits in these extremities and no spasticity was noted. Passive exercises for all joint motions of the left upper and lower extremities and active assistive to active re-educational exercises of the few remaining functioning muscles were initiated. No improvement was noted within the next two weeks; in fact, the left upper extremity became completely paralyzed. In the left lower extremity, the following muscles or groups of muscles were present as trace contractions: external and internal hip rotators, iliopsoas, quadriceps, and hamstrings. All other muscles in the left lower extremity were completely paralyzed. Mild flexor spasticity in the left upper extremity and mild extensor spasticity in the left lower extremity had developed.

Hypnosis was first attempted on 3 March. It was explained to the patient that the technic was a relaxing one for the twofold purpose of (1) testing muscle function under a minimum of tension and (2) accelerating the rate of recovery of muscle function. Because the patient was less alert following her cerebral accident, exhibiting an inappropriate silliness and a personality change, she was very distractible and unable to concentrate upon the suggestion of the therapist. Early attempts at hypnosis were therefore unsuccessful.

By the third attempt (5 March) the patient went into a deep trance. It was suggested that she was a few years younger. Her age level was tested initially by noting the last name, married or maiden, she used when questioned. Subsequently, age was determined by asking her which grade of school she was attending. The patient was successfully regressed to the age of four years, during which time she talked freely and co-operated with the hypnotist. However, at the regression age of two she would not talk, was negativistic, and would not play the games that were suggested. Therefore, the ages of three and four years were used for all subsequent exercises.

The first important phenomenon noted under hypnosis was that when ordered to throw a ball with her paralyzed arm or to kick it with her paralyzed leg, the patient complained that she could not move the extremity. She was puzzled when at all ages under hypnosis, she could not form the image of bouncing a ball with her left arm, although she could with her right. After repeated

strong suggestion that she was in a period prior to her paralysis, that she remembered how to move her extremities, and that she was moving them in a normal manner, the patient began to give evidence of re-establishing the mental image of kicking and throwing the ball, at all age levels, with the paralyzed as well as with the unaffected side. The patient was told that she would remember throwing and kicking the ball as if it were a dream. When she was awakened from the trance and reassured that she had co-operated so well that she relaxed and went to sleep, she excitedly reported to the therapist that she had dreamed she was moving all four extremities equally well. From that point she seemed to exhibit more hope and cheerfulness about the possibility of recovery.

During the next week the patient was repeatedly regressed to the age of three or four, depending on at which age she would follow the suggestion to exercise. The height to which she could kick her left leg was tested before hypnosis, after hypnosis prior to regression, and finally after hypnosis with regression to an earlier age in life. It was noted that the patient could kick highest during the last-mentioned period. Experiments have shown that muscle strength and endurance are increased in the normal human in the hypnotic state.[4] She was thus exercised both passively and actively while regressed under hypnosis. By 13 March, the patient was showing rather rapid return of function. In the left lower extremity the internal and external rotators of the hip were rated* 15 percent; iliopsoas, 35 percent; gluteus maximum, 15 percent; quadriceps, 50 percent; thigh adductors, 15 percent; hamstrings, 20 percent; and the gastrocnemius, 15 percent. This muscle test was done with the patient in her usual state, not under hypnosis. The function under hypnosis at age four was still greater than that without hypnosis. Within the next two weeks, the left pectoralis major and biceps brachii returned to voluntary function, being rated 15 percent. Three weeks after beginning the use of hypnosis (a total of nine sessions), the muscle function when not under hypnosis equalled that measured under hypnosis. Though hypnosis was continued until mid-July, the return-of-function curve had definitely diminished.

It had been recommended that the patient exercise periodically during the day as she lay in bed in order to re-educate and strengthen the returning muscles, but she rarely remembered to do this. A posthypnotic suggestion was given that she perform specific exercises every hour while awake. From then on, the patient could be seen to interrupt anything she might be doing

*Voluntary muscle testing: 0 percent, no contraction; 10 percent, trace contraction; 25 percent, full range of motion with gravity eliminated; 50 percent, full range of motion against gravity; 75 percent, full range of motion against gravity and partial resistance; and 100 percent, normal.

in order to exercise regularly, as suggested. This posthypnotic suggestion was reinforced periodically.

Active assistive to active re-education exercises for the weak muscles and resistive exercises for the antigravity muscle groups of the left upper and lower extremities were continued after cessation of hypnosis, and occupational therapy was directed toward increasing co-ordination and strength of the affected extremities. Also, in occupational therapy, dominance was changed so that she became right-handed. (An attempt to change dominance from her left to right side had been made at age five or six years, and the patient recalls this as a rather confusing period when she was ambidextrous.) By the end of April the patient was able to ambulate with the aid of a cane and left drop-foot brace. The left arm and hand had not as yet become functionally useful. A moderate degree of flexor spasticity in the left upper extremity and extensor spasticity in the left lower extremity had developed. The deep tendon reflexes on the left were still hyperactive and the left abdominal reflexes were still absent. A left Babinski was present. The mild dysarthria and left facial weakness had completely disappeared. The patient was discharged from the hospital during the last week of October, at which time the pulmonary tuberculosis, for which she was originally admitted, was arrested. Physical therapy was continued on an outpatient basis, and on 18 February 1953 voluntary muscle testing revealed the following: all muscles of the left shoulder girdle were rated from 10 to 40 percent; biceps brachii, 70 percent; triceps, 60 percent; long finger and thumb flexors and wrist extensors, 65 percent or better; and finger extensors and hand intrinsics from 0 to 45 percent. Despite the persisting paralysis of numerous intrinsic muscles, she is gradually learning by substitution and improved co-ordination to make maximal use of the left hand so that at present she can, for example, turn doorknobs and faucets and is attempting to knit. In the left lower extremity, all muscles were rated 50 percent or better with the following exceptions: internal and external hip rotators, 35 percent; peroneus group, 10 percent; and toe flexors and extensors, 15 to 40 percent. She walks with a slight but typical hemiplegic gait, has very little difficulty ascending and descending stairs, and at present is beginning to walk without the drop-foot brace. She has been able to assume partial responsibilities for the care of her young children and to perform routine housework.

DISCUSSION

Hypnosis was used for four purposes in this case:

1. To re-establish for the patient the mental image of moving her limbs. Judging from her inability to picture herself moving while under hypnosis, not only during the current period but also after regression, there seemed to be an interruption of the associ-

ation fibers or an injury of the image area. Thus the patient was "mentally" paralyzed as well as physically.

2. To regress the patient to an age of three to four years during which her active range of motion was immediately greater than when awake. This assistive "device" thus contributed to the early attainment of active exercise. Maximum benefit from re-education under hypnotic regression was realized during the first three weeks, though the process was continued for five months. We believe that the rapidity of initial benefit from hypnosis followed by a sudden decrease suggests that some other motor tracts, for example, inactive ipsilateral tracts or the extrapyramidal tracts, assumed the function of the injured contralateral pyramidal tract. The coincidence of the attempt to change dominance from the patient's left to right side at age five or six years, during which period she was ambidextrous, may have singled out our patient to favor reactivating ipsilateral tracts.

3. Posthypnotic suggestion was used to induce the patient to exercise regularly the returning muscles. Prior to this, the patient had been lax in following an exercise routine on the ward.

4. Finally, though by no means of least importance, the psychiatrist member of this team, because of his visits three times per week for hypnosis, was useful in supporting and motivating the patient through her periods of hopelessness and despair, intensified by the many practical problems arising from her paralysis subsequent to hospitalization for tuberculosis. Also, he helped prepare her for resumption of limited duties at home and for the care of her children.

Realizing that patients do spontaneously recover from hemiplegia due to cerebral embolus, a review of the literature as regards expected rate of recovery does not rule out the possibility that hypnosis was at least a factor in the return of muscle function, which we consider was both more rapid and more complete than when routine physical therapy measures alone are used, particularly in view of the progressive loss of function during the first few weeks of this patient's illness. We also believe that the combined use of hypnosis, psychotherapy, and physical and occupational therapy has resulted in a more complete rehabilitation of this person than could have been realized from the use of routine physical methods alone.

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MILITARY PATHOLOGISTS ATTEND SECOND INTERNATIONAL CONGRESS IN WASHINGTON

Many high-ranking foreign military medical officers were among more than 1,000 scientists from 35 countries who attended the second International Congress of Clinical Pathology in Washington, D. C., 6-11 September 1954, under the presidency of Dr. John R. Schenken, professor and chairman of the department of pathology at the University of Nebraska College of Medicine. Brigadier General Elbert DeCoursey, MC, USA, director of the Armed Forces Institute of Pathology, was chairman of the committee for local visits during the meeting, and Colonel Hugh R. Gilmore, Jr., MC, USA, curator of the medical museum of the Institute, headed the exhibits committee.

Brigadier General Elbert DeCoursey, second from right, describes an interesting scientific exhibit to Brigadier General Bürhanettin O. Tugan, left, Major General A. Sachs, and Group Captain W. P. Stamm.

The military visitors included Major General A. Sachs, C. B. E. Q. H. P., deputy director of medical services and senior pathologist of the Royal Army Medical Corps, Brigadier General Bürhanettin O. Tugan, professor of clinical medicine at the Gülhane Academy of Military Medicine in Ankara and president of the Association of Clinical Pathologists of Turkey, and Group Captain W. P. Stamm, principal specialist in pathology and tropical medicine for the Royal Air Force.

Construction of a Simple Intraluminal-Type Vein Stripper

THOMAS W. AYRES, *Captain, USAF (MC)*
HORACE W. BOGGS, Jr., *First Lieutenant, USAF (MC)*

THE treatment of varicose veins of the lower extremity has long been a perplexing problem. At present the most successful method of surgical management of varicose veins of the lower extremity is multiple saphenous ligation combined with stripping of the long saphenous segments. This method has been advocated since 1951,[1] when Emerson and Muller[2] described a flexible vein stripper. Since that time various types of intraluminal strippers have been reported.

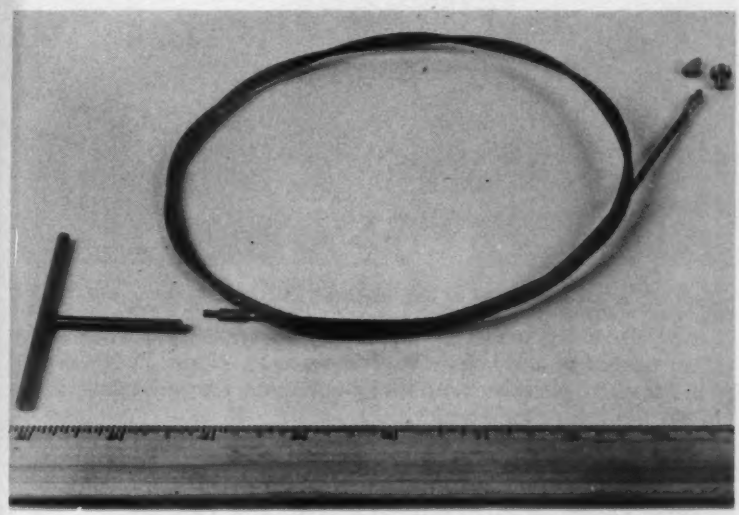

Figure 1. A flexible intraluminal vein stripper made from materials available at Air Force bases.

This type of treatment of varicosities of the lower extremities has been limited at some Air Force hospitals because commercially-produced intraluminal vein strippers are not always available through routine supply channels. The number of patients

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with varicose veins, suitable for combined ligation and stripping procedures, who sought treatment in our surgical clinic prompted the construction of a satisfactory vein stripper (fig. 1).

Figure 2. A detailed view of the threaded end of the cable, with bullet and conical tips.

The materials used for the construction of an intraluminal-type vein stripper are available at all Air Force bases. They include the following items:*

6500-270395 Cable, corrosion resisting, flexible.
6800-456450 Steel, chrome nickle, corrosion resisting, condition A composition G round rod, 1/2 inch.
6800-392500 Solder-silver wire class 4, 1/16 inch.

The cable used for aircraft control surface attachments is the strong, flexible, sufficiently smooth, braided wire. The tips can be easily shaped on a lathe by a skilled craftsman from the one-half inch rod.

The following technic is used by us: An initial incision is made parallel to and two centimeters below Poupart's ligament overlying the femoral pulsation. The long saphenous vein is

*U. S. Air Force Supply Catalogue 23 A.

ligated with No. 00 cotton suture at its origin from the femoral vein. Care is taken to ligate all branches of the saphenous vein. A second incision is made over the medial malleolus and the long saphenous vein is isolated, divided, and its distal segment ligated.

The vein stripper is then carefully threaded through the lumen of the long saphenous vein. The bullet-shaped guide has been

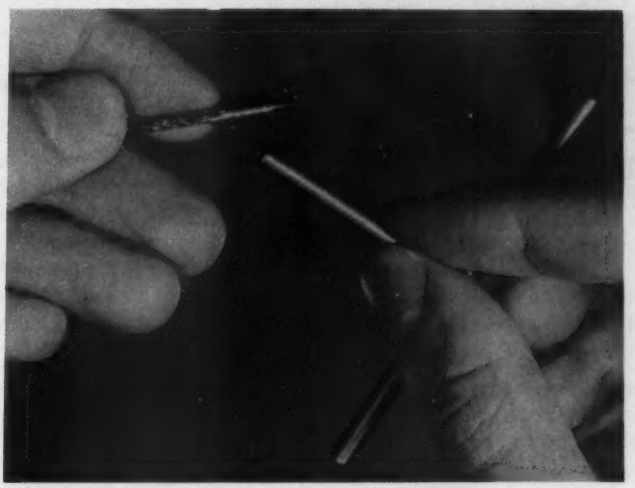

Figure 3. The T-shaped handle being attached to the threaded cable end.

satisfactory for this purpose (fig. 2). The distal portion of the long saphenous vein is tied to the conical-shaped tip. The guide tip is then replaced by a T-shaped handle (fig. 3). By steady pull the long saphenous vein is stripped in segments or its entirety. During the stripping procedure pressure is exerted by an assistant over the entire area. Ace bandages are applied over the entire leg and thigh after the wound is closed.

SUMMARY

A satisfactory intraluminal vein stripper can be constructed with a minimum of difficulty from materials available at Air Force bases. A stripping of the long saphenous vein can easily be accomplished with this instrument.

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Antigenic Relationship Between Species of Paracolobactrum and Vibrio Comma

WALTER F. MALIZIA, *Captain, MSC, USAR*

CHOLERA is a common disease in certain areas of the Far East. Its causative organisms are known to grow on various media used for the culture of enterobacteriaceae, and their differentiation from some paracolon organisms may cause diagnostic difficulties. Because of the frequent occurrence of species of paracolobactrum in the routine diagnostic procedures, and their possible pathogenic role in enteric diseases, it was of interest to determine whether routine diagnostic sera prepared from Inaba (AC) and Ogawa (AB) strains of *Vibrio comma* give cross agglutination reactions with paracolon strains isolated in this area.

TABLE 1. *Strains of paracolobactrum reacting in slide agglutination tests with unabsorbed cholera antisera*

Antigen from	Number of antigens tested	"HO" antisera (unabsorbed) agglutinated with		
		Inaba and Ogawa sera	Inaba serum only	Ogawa serum only
P. coliforme	120	4	3	8
P. aerogenoides	10	0	0	0
P. intermedium	10	0	0	4
P. Bethesda	10	1	4	1
P. Arizona	10	0	0	0

One hundred and twenty strains of *Paracolobactrum coliforme*; 10, *Paracolobactrum intermedium*; 10, *Paracolobactrum aerogenoides*; 10, *Paracolobactrum Bethesda*; and 10, *Paracolobactrum Arizona* strains were tested against "HO" and single-factor sera prepared in this laboratory from Inaba and Ogawa strains of *V. comma*. The procedures recommended by Ranta and Dolman[1]

From 406th Medical General Laboratory, APO 500, San Francisco, Calif.

were used for the production of the *V. comma* sera. The antigens used for the slide agglutination test were saline suspensions of 18-hour agar slant cultures heated to 100° C. for two hours and preserved with merthiolate (1:10,000 dilution). Of the 160 paracolobactrum cultures examined, 25 agglutinated in varying degrees (2 to 4 plus) in either or both of the Inaba and Ogawa "HO" sera. Table 1 shows the results of these tests.

TABLE 2. *Strains of paracolobactrum reacting in slide agglutination tests with absorbed cholera antisera*

Antigens	Number of antigens used	O Sera	
		Inaba absorbed with Ogawa (C)	Ogawa absorbed with Inaba (B)
P. coliforme	7	0	0
P. intermedium	2	0	0
P. Bethesda	4	1	0

It is interesting to note that all of the strains of *P. aerogenoides* and *P. Arizona* failed to agglutinate in either Inaba or Ogawa serum. *P. intermedium* was not agglutinated in Inaba serum. Because the number of strains of these types was small, however, it would hardly be valid to assume that they contained no common antigens. The results of agglutinations with Hikojima serum (AB(C)) were omitted in this report because of its close relationship to the Ogawa strain. The Ogawa and Hikojima strains differ only quantitatively with respect to the C antigen, so that these strains may be looked upon as variants of the same O form (2 to 3).

Table 2 shows the results of slide agglutinations with those strains which agglutinated in the "HO" unabsorbed sera to a three- to four-plus reaction, against single factor (absorbed) Inaba (C) and Ogawa (B) antisera.

P. Bethesda strain No. 218 agglutinated in the Inaba "HO" serum with a four-plus reaction, and in the single-factor serum with a three-plus reaction, indicating the presence of a common "C" factor. Agglutination of this strain occurred with dilutions of the Inaba serum to about 12.5 percent of the titer against its homologous organism. This indicates a fairly close antigenic relationship between the *P. Bethesda* strain and the *V. comma* (Inaba) strain. Whether this similarity indicates that this strain plays a more important role in enteric infections than previously recognized warrants further study.

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The fact that reactions did occur with other strains only serves to emphasize the necessity for careful use of cholera antisera in diagnostic procedures.

CONCLUSION

An antigenic relationship between some species of paracolobactrum and certain cholera vibrios does exist. With further studies a more conclusive relationship may be demonstrated.

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TREATMENT OF PROSTATITIS

A pertinent question is, should treatment of prostatitis be advised whenever found? If the patient is less than 40 years of age, treatment is usually indicated. This is an arbitrary selection of age and one should not be dogmatic about it in all cases. In general, however, it has been a satisfactory plan of attack. One factor in the decision that treatment is needed is the nature of the patient's symptoms. Certainly if significant urinary complaints such as burning and frequent urination, dysuria and nocturia, are present, treatment is indicated. Frequently aching low in the groin or low suprapubic distress may be noted. A true urethral discharge is seldom seen unless stricture is present. Perineal pain is *not* a symptom of prostatitis and in our experience is invariably related to a functional disorder. Too frequently this symptom with fleeting testicular distress and a watery urethral discharge, usually present only after stripping the urethra, will be attributed to the incidental finding of prostatitis when in almost every instance they are an expression of anxiety or tension state brought about by past indiscretions or erroneous ideas concerning various and sundry sexual complexes. It might be well to mention here that prostatitis is never responsible for psychic impotence or premature ejaculation or any of the other various disturbances of the sexual function.

—EDWARD N. COOK, M. D.
in *Proceedings of the Staff Meetings of the Mayo Clinic*, p. 248, May 5, 1954

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John R. Watson, *Capt., MC, USA*
Gale A. Westerdoll, *Maj., USAF (MSC)*
Robert L. Whitfield, *Jr., Lt. Col., MC, USA**
Lillian B. Wilary, *1st Lt., ANC, USA*
Thomas E. Young, *1st Lt., MC, USA*
Sidney Zeitler, *Capt., MC, USA*
Winifred R. Zirkle, *Maj., ANC, USA*

*Oak Leaf Cluster.

**Erroneously reported in the June issue of this *Journal* as (MSC).

The names of officers of the medical services who have been awarded decorations by the United States Army, Navy, or Air Force are published in this department each month following receipt of information from official sources.—*Editor*

CHIEFS OF FEDERAL DENTAL SERVICES MEET TO DISCUSS MUTUAL PROBLEMS

The chiefs of the Federal dental services met recently in Washington, D. C., as the luncheon guests of Rear Admiral Daniel W. Ryan (DC) USN, Assistant Chief for Dentistry and Chief of the Dental Division of the Bureau of Medicine and Surgery, to discuss informally their mutual professional interests and problems.

Left to right: Dr. John E. Fauber, Major General Oscar P. Snyder, DC, USA, Rear Admiral Daniel W. Ryan (MC) USN, Brigadier General Marvin E. Kennebeck, USAF (DC), and Dr. John W. Knutson.

Members of the group, who with Admiral Ryan comprise the top dentists in the U. S. Government, included: Dr. John E. Fauber, Assistant Chief Medical Director for Dentistry, Veterans Administration; Major General Oscar P. Snyder, DC, USA, Assistant Surgeon General and Chief of the Dental Corps, U. S. Army; Brigadier General Marvin E. Kennebeck, USAF (DC), Assistant for Dental Services, Office of the Surgeon General, U. S. Air Force; and Dr. John W. Knutson, Assistant Surgeon General and Chief Dental Officer, U. S. Public Health Service.

REGULAR MEDICAL CORPS OFFICERS CERTIFIED BY SPECIALTY BOARDS

The American Board of Neurological Surgery

Since its organization in 1940, the American Board of Neurological Surgery had certified on 30 June 1953 a total of 486 physicians in this specialty, of whom the following eight are regular officers of the military services:

Frank B. Clare, *Lt. Comdr., USN*
William H. Druckemiller, *Comdr., USN*
Richard W. Garrity, *Capt., USN*
George J. Hayes, *Lt. Col., USA*
William J. James, *Comdr., USN*
Warren H. Kimsey, *Lt. Col., USA*
John Martin, *Col., USA*
Arthur L. Schultz, *Comdr., USN*

The American Board of Plastic Surgery

The following six officers of the regular Medical Corps are certified by the American Board of Plastic Surgery which was activated in 1937 and, on 30 June 1953, had certified 275 physicians:

Joseph R. Connelly, *Comdr., USN*
James Crawford, *Comdr., USN*
Hal B. Jennings, Jr., *Lt. Col., USA*
Leo E. Potter, *Capt., USN*
Bernard N. Soderberg, *Col., USA*
Wilfred T. Tumbusch, *Lt. Col., USA*

The American Board of Proctology

Most recently activated of the official specialty groups, the American Board of Proctology from 1949 until 30 June 1953 certified 144 physicians, including the following regular officer:

George M. Lynch, *Comdr., USN*

The Board of Thoracic Surgery

The Board of Thoracic Surgery, an affiliate of the American Board of Surgery, was established in 1948. Of its 397 diplomates, on 30 June 1953, who must first be certified by the parent board, the following five physicians are regular Medical Corps officers:

Marion L. Connerley, *Comdr., USN*
James H. Forsee, *Col., USA*
Joseph M. Hanner, *Capt., USN*
John M. Salyer, *Col., USA*
Clifford F. Storey, *Capt., USN*

This is the thirteenth of a series. The names of officers certified by the American Board of Physical Medicine and Rehabilitation will be published in the November issue.

MILITARY DENTISTS TO SPEAK AT ANNUAL A. D. A. MEETING IN MIAMI, 8-11 NOV.

More than 30 officers of the Army, Navy, and Air Force medical services will participate in the scientific program of the ninety-fifth annual meeting of the American Dental Association in Miami, Fla., 8, 9, 10, and 11 November 1954. Colonel Jack B. Caldwell, DC, USA, Letterman Army Hospital, San Francisco, is chairman of the Section on Oral Surgery and Anesthesia and Lieutenant Henry M. Tanner (DC) USN, U. S. Naval Dental School, Bethesda, Md., heads the Section on Operative Dentistry.

The scientific exhibits include a presentation of surgical anomalies and procedures prepared by Lieutenant Colonel Walter H. Becker, DC, USA, Fort Sheridan, Ill.

Speakers on the scientific program include the following officers:

9 November

Basic Phenomenology of Nuclear Explosions—Lt. Col. Gerald M. McDonnel, MC, USA, Walter Reed Army Hospital, Washington, D. C.

Training of Dentists in Specialized Treatment—Lt. Col. Curtis P. Artz, MC, USA, Brooke Army Medical Center, San Antonio, Tex.

Factors Influencing the Cutting Characteristics of Rotating Dental Instruments—Col. Donald C. Hudson, USAF (DC), National Bureau of Standards, Washington, D. C.

Selection and Use of Rotating Dental Cutting Instruments (motion picture)—Maj. Jack L. Hartley, USAF (DC), National Bureau of Standards, Washington, D. C.

Progress Report on Ultrasonics in Dentistry—Comdr. Arne G. Nielsen (DC) USN, National Naval Medical Center, Bethesda, Md.

Registration of Centric and Protrusive Relationship—Lt. Col. Edwin H. Smith, Jr., DC, USA, Walter Reed Army Medical Center, Washington, D. C.

Full Service the Prosthodontist Should Render in Cranioplasty—Capt. Alvin H. Grunewald (DC) USN, U. S. Naval Training Center, Great Lakes, Ill.

Esthetics in Anterior Bridge Prosthodontics—Lt. Col. George H. Moulton, DC, USA, Brooke Army Medical Center, San Antonio, Tex.

10 November

Dilemma: Dentures or Masticatory Insufficiency for American Youth—Capt. Harry E. Denen (DC) USN, U. S. Naval Hospital, Chelsea, Mass.

Maxillary Sinus in Relation to Extraction of Teeth—Col. Lowell E. McKelvey, DC, USA, Brooke Army Medical Center, San Antonio, Tex.

Rebuilding the Resorbed Alveolar Ridge—Comdr. Clarence H. Blackstone (DC) USN, National Naval Medical Center, Bethesda, Md.

The following table clinics will be given by Dental Corps officers:

Improved Speech in Complete Denture Construction—Lt. Col. Leslie R. Allen, USAF (DC), Randolph Air Force Base, Tex.

Open and Closed Methods for Reduction and Fixation of Fractured Facial Bones—Lt. Col. Walter H. Becker, DC, USA, Ft. Sheridan, Ill.

Subperiosteal Dental Implants—Col. Roy L. Bodine, Jr., DC, USA, Camp Gordon, Ga.

Impression Technic for Complete Dentures—Lt. Col. Allen A. Brewer, USAF (DC), March Air Force Base, Calif.

Clinical Effect of X-Radiation on Normal Oral Tissues—Lt. Col. George W. Burnett, DC, USA, Walter Reed Army Medical Center, Washington, D. C.

Temporomandibular Joint Roentgenography—1st Lt. Byron G. Butt, USAF (DC), Randolph Air Force Base, Tex.

Reproduction of Tissue Surface in Complete and Partial Dentures—Maj. Sebastian J. Campagna, DC, USA, Walter Reed Army Medical Center, Washington, D. C.

Cosmetic Effects Obtained With Immediate Complete Dentures—Lt. Comdr. Richard G. Cooper (DC) USN, Marine Corps Recruit Depot, Parris Island, S. C.

Extraction of Simple and Complicated Impacted Teeth Using Local Anesthesia—Maj. George Dedunyk, USAF (DC), Keesler Air Force Base, Miss.

Antibacterial Resins—Col. Theodore E. Fischer, USAF (DC), Randolph Air Force Base, Tex.

Direct Method of Preparing Three-Quarter Crowns—Maj. Emmett J. Folgert, USAF (DC), Sheppard Air Force Base, Tex.

Rational Therapeutics in Endodontic Treatment—Lt. Comdr. Warren J. Hedman, Jr. (DC) USN, National Naval Medical Center, Bethesda, Md.

Recognition of Incipient Periodontal Disease—Comdr. Samstone Holmes (DC) USN, National Naval Medical Center, Bethesda, Md.

Procedures and Armamentarium in Dentistry for Children—Maj. Daniel G. Karrel, DC, USA, Walter Reed Army Medical Center, Washington, D. C.

Importance of the Recovery of the Denture-Bearing Tissues in Impression Making—Comdr. Robert B. Lytle (DC) USN, National Naval Medical Center, Bethesda, Md.

Partial Denture Prosthesis for the Young Inductee—Lt. Col. Charles D. Parr, USAF (DC), Chanute Air Force Base, Ill.

Biopsy Technic for the General Practitioner—Col. Robert B. Shira, DC, USA, Walter Reed Army Medical Center, Washington, D. C.

Equilibration of Occlusion—Maj. Chester A. Stanley, USAF (DC), Forbes Air Force Base, Kans.

Emergency Cricothyroidotomy—Comdr. Herbert J. Towle, Jr. (DC) USN, National Naval Medical Center, Bethesda, Md.

Management of Infections of the Head and Neck of Dental Origin—Lt. Daniel Verne (DC) USN, U. S. Naval Hospital, Yokosuka, Japan.

Alveoloplastic Procedures Used in Immediate Denture Prosthesis—Capt. Sherman B. Watson, USAF (DC), Kirtland Air Force Base, N. Mex.

DEATHS

ALBERT, Joyce Abraham, Lieutenant Colonel, USAFR (MC), 8th Tactical Hospital, Suwon, Korea; graduated from University of Oregon Medical School in 1930; ordered to active duty 17 March 1951; died 28 July 1954, age 49, from injuries received in an aircraft accident in Korea.

BREWSTER, Richard Ellsworth, Lieutenant, junior grade (MC) USN, U. S. S. *Everglades;* graduated from University of Kansas School of Medicine in June 1952; ordered to active duty in June 1952; commissioned in the Regular Navy on 1 July 1954; died 22 August 1954, age 26, of poliomyelitis at the U. S. Naval Hospital, Portsmouth, Va.

LYNN, Frank Wisner, Lieutenant Colonel, MC, USA, Military Assistance Advisory Group, Formosa; graduated in 1942 from University of Chicago School of Medicine; entered military service 1 July 1943; commissioned a first lieutenant, regular army, 17 December 1943; killed 3 September 1954, age 39, by Chinese Communist artillery fire on Quemoy Island, off the coast of China.

RAHLFS, Dorothea Julia, Lieutenant, junior grade (NC) USNR, U. S. Naval Hospital, Great Lakes, Ill.; graduated in 1946 from the Evangelical Hospital School of Nursing, Chicago, Ill., appointed lieutenant, junior grade, 1 February; ordered to active duty in March 1954: died 24 August 1954, age 28, of injuries received in an automobile accident near Great Lakes, Ill.

SCHWARTZ, Edward Norton, Lieutenant Colonel, USAF (MC), U. S. Air Force Hospital, Moody Air Force Base, Ga.; graduated from University of Colorado School of Medicine in 1939; ordered to active duty 5 July 1940; died 9 August 1954, age 40, at Moody Air Force Base, of coronary thrombosis.

SIMS, Milfred Earl, Lieutenant (MSC) USN, Bureau of Medicine & Surgery, Department of the Navy, Washington, D. C.; entered the military service 21 February 1927; appointed warrant pharmacist in 1943; commissioned lieutenant in 1949; died 14 August 1954, age 47, in Alexandria, Va., of coronary occlusion with myocardial infarction.

YUNDT, Ava Paine, Lieutenant (NC) USN, U. S. Naval Hospital, Philadelphia, Pa.; graduated from Michael Reese Hospital School of Nursing, Chicago, Ill., in 1933; ordered to active duty in September 1942, commissioned in the Regular Navy 6 November 1946; died 2 September 1954, age 42, in Philadelphia, from acute barbiturate poisoning.

A MESSAGE FROM THE A. M. A.

During the Second Session of the Eighty-Third Congress, which adjourned 20 August 1954, a number of laws of interest to members of the medical profession were enacted. Because physicians on active duty in the armed services may not have ready access to information in this connection, a brief summary is presented here.

Hospital Construction. A bill providing for expansion of the "Hill-Burton" hospital construction program was enacted (P. L. 482, 83d Congress). In brief, it provides for grants to the states for construction of hospitals for the chronically ill, nursing homes, rehabilitation centers, and diagnostic-treatment centers.

About $23 million has been appropriated to carry out this law for the next fiscal year, allocated as follows: $6.5 million for hospitals for the chronically ill; $6.5 million for diagnostic-treatment centers; $4 million for nursing homes; $4 million for rehabilitation centers; and $2 million for state surveys.

Vocational Rehabilitation. A law designed to greatly expand programs for vocational rehabilitation (P. L. 565, 83d Congress) includes provisions (1) authorizing matching grants to the states in increasing amounts, from $30 million for fiscal 1955 to $65 million for fiscal 1958; (2) establishing a National Advisory Council on Vocational Rehabilitation to advise the Secretary of Health, Education, and Welfare on special projects; (3) changing the formula for federal contribution to one varying inversely with per capita income; (4) authorizing 75 percent federal grants for "extension and improvement" of state rehabilitation projects for up to three years, with $5,000 per state minimum; (5) authorizing a demonstration rehabilitation center in the Washington, D. C. area; and (6) enlarging provisions granting blind persons preference for operating vending machines on federal property.

Doctor Draft Law. S.3096 (P. L. 403, 83d Congress), which proposed an amendment to the Doctor Draft Law, authorizes the Department of Defense to use doctors in an enlisted status, thus removing the requirement relative to commissioning, in security cases.

Tax Bill. The Internal Revenue Code of 1954 (P. L. 591, 83d Congress, approved 16 August 1954), includes two provisions of particular interest to the medical profession:

From the Council on National Emergency Medical Service of the American Medical Association. The views and opinions expressed are not necessarily those of the Department of Defense.—*Editor*

(1) *Medical expense deductions.* Taxpayers under the new bill will be allowed to deduct medical expenses in excess of three percent of adjusted gross income (formerly five percent), with a maximum deduction for single persons of $2,500 (formerly $1,250), and a maximum deduction on a joint return of $10,000 (formerly $5,000). The cost of drugs is not included in the medical deduction, but can be counted as a deduction to the extent that they exceed one percent of adjusted gross income.

(2) *Health and accident insurance.* Employer-financed accident and health benefits are fully exempt if they represent reimbursement for actual medical expenses (under former law some employer-type benefits not exempt), but such benefits are taxable over $100 if they are compensation for loss of wages under either an insured or noninsured plan.

Extension of Social Security. A bill providing various amendments to the Social Security Act extends the coverage and increased contributions and benefit payments. It does *not* include the coverage of physicians under the Old Age and Survivors Insurance provision of the Act, although it does include the objectionable "waiver of premium" provision for permanent and total disability.

National Fund for Medical Education. This bill authorizes a federal charter for the National Fund for Medical Education. Under this law the corporation's membership consists of a large group of leaders in business, government, and the professions. Four doctors are included on the board of directors.

Transfer of Indian Hospitals to USPHS. This bill (H. R. 303), effective on 1 July 1955, transfers the administration of health services for Indians and the operation of Indian hospitals from the Department of the Interior to the U. S. Public Health Service, in the Department of Health, Education, and Welfare (P. L. 568, 83d Congress).

It wasn't fear of the hazards that actuated Columbus, Magellan, De Gama, the Wright brothers, Lindbergh, Ernie Pyle, and Leonard Wood. The grace and curse of mankind is his instinctive acceptance of the concept: It Can't Happen To Me. Rare indeed is the soldier who expects to be shot by the enemy. He's going to be the enemy.

—LOUIS J. BAILEY, M. D.
in *Detroit Medical News*,
p. 6, July 12, 1954

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Beck, A. T., Capt., MC, USAR: Dynamic therapeutic program for psychiatric open ward. *Mil. Surgeon* 115: 128-132, Aug. 1954.

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CORRESPONDENCE

To the Editor:—What a happy thought, publishing Sir William Osler's "The Army Surgeon" in your March issue. It is most entertaining to read, and is a magnificent expression of English, touching on all the aspects which have confronted young medical men joining the services.

It is a great privilege to read what is actually a type of classic in its way, in these days of a more precise and less colorful diction which our mechanical age forces us into using. We feel it is well worth bringing to the notice of all medical officers, and I think this might, as a literary treat and as a purveyor of the practical approach to problems, be of value . . .

Congratulations on the *Journal* which we all read with interest here.

Air Vice Marshal E. A. DALEY
Director General of Medical Services
Royal Australian Air Force

BOOK REVIEWS

CARDIOVASCULAR SURGERY, by *Gerald H. Pratt*, M. D. 843 pages; 358 illustrations on 261 figures and 4 plates in color. Lea & Febiger, Philadelphia, Pa., 1954. Price $15.

Advances in the field of cardiovascular surgery are taking place today perhaps with greater rapidity than in any other surgical specialty, if not in the entire field of medicine. This suggests the difficulty faced by an author who attempts to write an up-to-date text covering a subject for which new diagnostic and therapeutic technics are announced almost weekly. Doctor Pratt has undertaken this enormous task and, in general, his efforts have been remarkably successful. Within the covers of this one book practically all cardiovascular surgical conditions are discussed from the standpoint of etiology, pathology, diagnosis, and treatment. An outstanding omission is the lack of due reference to intracranial aneurysms and vascular malformations, an important and not uncommon group of vascular surgical lesions.

The rapid changes which are taking place in the diagnosis and treatment of congenital and acquired heart lesions make this subject a difficult one, but the author has covered it well in the volume's nine sections. It would be impracticable or impossible to include all diagnostic measures and operative procedures which have been advocated for these lesions, but most of those whose worth has been proved are included. The diagnosis and repair of septal defects and of chronic constrictive pericarditis are two subjects that could well have been discussed in greater detail.

The two sections on the arterial and venous systems are the meat of this book. The general context is similar to that of *Surgical Management of Vascular Diseases*, a book by the same author that appeared in 1949, but it has been extensively edited or completely rewritten, and much new material added. These subjects are dealt with clearly, comprehensively, and authoritatively.

Despite its over-all merit, certain minor criticisms may be leveled at this work. It contains considerable repetition, a fact that is naturally much more apparent to a reviewer who reads the book from cover to cover than it will be to one who uses it for reference. Nevertheless, had repetition been kept to a minimum, a briefer, more compact book, containing essentially all of the material in this volume, could have been produced. A more thorough job of proofreading would have eliminated errors in punctuation and spelling, particularly of proper names.

These occur with distressing frequency and include: Collins (Collens); Wagensteen (Wangensteen); Sustinsky (Satinsky); Jarnszewski (Jaruszewski); Lillehie (Lillehei); Valpeau (Velpeau); Pott, Perc. (Sir Percival Pott); and Meier (Maier).

This book is well illustrated, and the drawings are generally excellent. Unfortunately, some of the photographs of gross specimens and operative procedures do not illustrate clearly the point intended. A valuable feature of this text is the complete bibliography at the end of each chapter and a well-arranged index.

The relatively unimportant faults of this book to which some reference has been made do not seriously detract from its value. It is an excellent and up-to-date book and is highly recommended as a reference work on cardiovascular surgery. Although it will probably prove to be of greatest value to general surgeons interested in vascular disease, this book will make an important addition to the library of all members of the profession who are interested in the subject with which it deals.

—*CLIFFORD F. STOREY, Capt. (MC) USN*

MANUAL OF CLINICAL MYCOLOGY, by *Norman F. Conant,* Ph. D.; *David Tillerson Smith,* M. D.; *Roger Denio Baker,* M. D.; *Jasper Lamar Callaway,* M. D.; and *Donald Stover Martin,* M. D. 2d edition. 456 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1954. Price $6.50.

This second edition brings up to date the Manual of Clinical Mycology, which was first published under the auspices of the National Research Council during World War II. The original volume proved so popular that it was out of print in the early 1950's, and the constant demand resulted in this new edition.

If the mycoses are considered as divided into three large classes—superficial, intermediate, and deep—it can be said that this manual is the best available source of information about them. In the discussion of the deep mycoses, each disease is covered in detail, with excellent illustrations and a summary of the findings of the work done in other countries. The references are complete and the style good. If any criticism of this section is justifiable, it is that insufficient detail is given to the place of the stilbamidines in therapy.

The intermediate mycoses are also presented in a manner which leaves very little to be desired. The illustrations are as good as can be expected without the use of color. The text has some shortcomings, however, in the sections on the superficial mycoses. In relation to the number of cases seen by the practicing physician, it seems that more space and detail should be devoted to such diseases as tinea capitis and dermatophytosis of hands and feet. The section on treatment of the superficial fungus diseases is weak in regard to such details as to which medication is preferable, what to expect clinically while under treatment, and length of time required for results. In discussing tinea versicolor, this text, like most others, states that the lesions fluoresce

under Wood's ultraviolet light. Such fluorescence is the exception rather than the rule, and many diagnoses would be missed if fluorescence were sought for in each case.

The inclusion of the synonyms of each disease is an especially valuable feature for those medical officers who often see some of these conditions in another part of the world under such names as Gogo and Busse-Buschke disease. The very adequate formulary which is included in the appendix will prove useful to all using the text.

This manual should occupy a "front and center" spot on the book shelf of military medical officers. It is "must" reading for all in the field of dermatology.—*WAYNE WRIGHT, Lt. (MC) USN*

THE TECHNIQUE OF PSYCHOTHERAPY, by *Lewis R. Wolberg*, M. D. 869 pages. Grune & Stratton, Inc., New York, N. Y., 1954. Price $14.75.

Considering the many volumes published yearly on psychiatric subjects, books which approach the problem of psychotherapy in a systematic way are somewhat of a rarity. The majority usually present the subject from the viewpoint of the author or the school that he represents. This volume is unusual in that the author attempts a comprehensive examination of those factors that can be extracted from any sound therapeutic situation "irrespective of the specific 'kind' of psychotherapy done and without reference to the individual 'style' of the therapist."

The 53 chapters are grouped under five main sections dealing with the general principles of psychotherapy, the beginning phase, the middle phase, the terminal phase, and special aspects of psychotherapy. The principles discussed are supported by numerous well-chosen illustrative recordings of actual therapy sessions. In addition there is a complete case history consisting of about 100 pages of dialogue recorded from the treatment hours. There are 481 references cited, and in addition there is an adequate recommended reading list on the various types of psychotherapy and related subjects.

The beginner in psychotherapy will find this book of great value. It is also an excellent addition to any psychiatrist's library. The chapter on "who can do psychotherapy" is quite provocative and very succinctly presents the problem of the psychiatrist's relationship to the clinical psychologist and the psychiatric social worker. The novice will also find the chapters on "answering questions patients ask about therapy" and "questions therapists ask about psychotherapy" stimulating.

The adherents of various formal schools of psychotherapy could possibly criticize this volume for overemphasizing the interpersonal aspects of therapy at the expense of the intrapsychic. An eclectic approach such as this, however, which attempts to present validated technics and procedures extracted from the different schools of psy-

chiatry, psychology, and the other social sciences, would become utterly incomprehensible if the various theories of intrapsychic mechanisms were given as much importance as the technics discussed. The author has been successful in writing a textbook on the technics of therapy which will be of definite value to the student irrespective of his theoretic background or his adherence to any school of therapy.

—*EDWARD J. KOLLAR, Jr., Maj., USAF (MC)*

CLINICAL PSYCHIATRY, for Practitioners and Students, by *Ian Skottowe*, M. D. 395 pages. McGraw-Hill Book Co., Inc., New York, N. Y., 1954. Price $8.75.

This excellently written practical treatise on the practice of psychiatry is directed to general practitioners and medical students. Attention in the early chapters is focused on the integration of psychologic, somatic, and social factors in the study of health and sickness as a whole. The sections following are devoted to case-history taking and principles of treatment. The last half of the book gives finely drawn descriptions of the various clinical states, with pertinent suggestions for management of each. Throughout, the style is vivid, the descriptions are accurate, and the patient as a person is emphasized.

Because this book is by an English physician practicing in Great Britain, several variations from American practice are noted. The diagnostic nomenclature includes such entities as schizophrenoid states and paraphrenia, not commonly used in this country. It was startling to this examiner to find that psychoanalysis as a method of treatment is given no more space than occupational therapy.

The book is well printed and designed, in an easy to read type, but the bibliography seems somewhat inadequate. It is recommended for reading by students and medical officers who seek guidance in the many psychiatric problems they encounter in their day-to-day work.

—*FELIX H. OCKO, Capt. (MC) USN*

PSYCHOPHYSIOLOGIC MEDICINE, by *Eugene Ziskind*, M. D. 370 pages. Lea & Febiger, Philadelphia, Pa., 1954. Price $7.

This book is written primarily for the physician who is not specializing in psychiatry. It is not a text of psychosomatic medicine; rather, it is generally concerned with those psychiatric factors involved in any illness. More specifically, it considers the "psychophysiologic" aspects of psychiatric illnesses mediated through the autonomic nervous system.

Divided into two general parts, the first portion undertakes a review of those methods used to elucidate the psychiatric factors involved in any illness. Included here are sections containing specific technics and suggestions for short-term superficial psychotherapy. The second part of the volume is a review of the background, origins, and current thought in the various schools of modern dynamic psychiatry. The

last chapter, entitled "Diseases Commonly Called Psychosomatic," is a brief review of some of the causative problems of such common diseases as peptic ulcer, asthma, and hypertension. The author's conclusions are cautious and restrained.

Dr. Ziskind, who heads a psychiatric clinic in a general hospital, is not an advocate of any one particular school of psychiatric thinking; instead, his viewpoint is eclectic and practical. He emphasizes that psychiatric factors in illness are amenable to psychotherapeutic technics on a short-term basis. He believes that the nonspecialist willing to devote the extra time may achieve worth-while results with his patients.

This book may be useful to any physician interested in applying himself in the areas outlined. The medical student, intern, and resident in other specialties, may find the principles of interview technics helpful. Perhaps some of the author's enthusiasm for his subject will rub off on (and fortify) the physician who is wary of his patient's "psyche."—*MERVYNO SHOOR, Comdr. (MC) USN*

A MANUAL ON CARDIAC RESUSCITATION, by *Robert M. Hosler*, M. D. 183 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $4.

This timely book should be read thoroughly by all physicians responsible for the management of surgical patients. Well-written, concise, and to the point, it clearly describes the treatment of cardiac arrest. Stress is placed on the early recognition of this condition and that "action must be immediate." A previous, properly developed reflex maneuver by the surgeon should become so automatic that it will result in action without error. The importance of differentiating between cardiac standstill and ventricular fibrillation is emphasized, and the proper steps to follow in both instances are accurately described. The various causes of cardiac arrest are discussed, as well as preventive measures which should be taken at all times.

An excellent chapter on "The Danger Signals of Cardiac Arrest," written by an anesthesiologist, is especially valuable. The preparation of resuscitation kits and the necessary drugs that should be available is adequately discussed, and a brief description of the defibrillating machine and the value of a mechanical respirator are included.

A step-by-step program is outlined for the re-establishment of the oxygen-system and for the restoration of the heartbeat. In a logical sequence these steps should become automatic to all operating teams. Various methods of cardiac massage are described in sufficient detail to properly combat this grave situation. The postoperative management is briefly summarized in similar fashion. This small volume contains all of the important factors that should be known to correct this serious surgical complication.—*RALPH E. BROWN, Jr., Maj., MC, USA*

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ATLAS OF ORTHOPEDIC TRACTION PROCEDURES, by *Carlo Scuderi*, M. D., Ph. D. 230 pages; 124 illustrations. The C. V. Mosby Co., St. Louis, Mo., 1954. Price $12.50.

This 230-page atlas depicts by word and illustration the procedures for traction commonly employed in handling orthopedic and fracture patients wherever encountered. The compilation of such data as this between one set of covers has never before, to my knowledge, been satisfactorily accomplished. The mass of detail and variability of different traction technics practiced in various parts of the world has resulted in a welter of eponyms which are difficult for the student, intern, resident, and orthopedic assistant to master. In this volume Dr. Scuderi has handled this problem satisfactorily by giving detailed instructions and illustrations of the common traction procedures. Under each particular type of procedure he has listed the indications, the items required for the application of the traction, and his detailed comments.

Inasmuch as the proper maintenance of traction requires constant nursing and technical management, this book will be an invaluable aid to those entrusted with the care of receiving traction patients and for the instruction of attendants. Beginning with a description of the basic requirements for hospital traction equipment, the atlas contains information concerning the care of the skin of the patient and a description of hospital beds as well as of the various types of mattresses, overhead frames, and other permanent parts of the armamentarium. It then takes up, one by one, the popular methods in traction, ranging all the way from "Buck's" skin traction to skeletal traction by means of skull tongs for injuries to the cervical area.

Throughout this atlas one of the most striking features is the clarity of the illustrative material. These are mainly photographic in type but, where for emphasis diagrammatic representations are used, they are similarly well-prepared and fully explanatory. While there may be some minor variations practiced in different institutions, certainly no one can find serious fault with the subject matter or its mode of presentation. The latter is so clear that medical personnel not ordinarily connected with traction management could, in an emergency, rely on it in the application of the indicated procedure. Its very availability should lessen the incidence of poor traction—or worse, no traction for lack of "know-how." It seems certain that this volume will shortly become a standard reference work, available in all orthopedic wards and plaster rooms.—*CHALMERS R. CARR, Capt. (MC) USN*

RH-HR BLOOD TYPES, by *Alexander S. Wiener*, M. D. 763 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1954. Price $11.50.

In this volume, Doctor Wiener, codiscoverer of the Rh factor, has presented chronologically a collection of the representative and most significant contributions to the subject, including the source material

in this complex and fascinating field from which the conclusions were drawn. Included in the volume are 84 papers under the headings of historical background, fundamental observations, pathogenesis of erythroblastosis fetalis, Rh antibodies, Rh-Hr types and their heredity, nomenclature of the Rh-Hr types, anthropologic aspects, erythroblastosis fetalis and exchange transfusion, the M-N-S blood types, medicolegal applications, A-B-O incompatibility in pregnancy, autoantibodies and disease, blood transfusion, fundamental principles, and technic of tests.

The articles describe the role of the Rh factor in the pathogenesis of erythroblastosis fetalis and the use of exchange transfusions for the treatment of the disease. They also discuss the immunologic mechanisms involved in acquired hemolytic anemia. Of unusual interest are the significant and wide applications of the Rh-Hr types in anthropology, in general immunology studies, and in disputed paternity proceedings.

The author writes in an enviable, pleasant style; his own interest and enthusiasm in the subject leads one to believe it is less complex than it is. The volume is beautifully printed. It has an extensive author and subject index, as well as bibliography. No other writer could have written with more authority on this subject. This volume will serve as an excellent reference work for hematologists and immunohematologists; it should be in the library of all those charged with the operation of blood banks and with the instruction of blood bank personnel. It also will be a welcome reference for members of the legal profession who occasionally deal with problems of disputed parentage.

—GIOCONDA R. SARANIERO, Lt. Comdr. (MC) USN

THE MEGALOBLASTIC ANAEMIAS, by *L. J. Davis*, M. D., and *Alexander Brown*, M. D. 113 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $4.50.

This book was written in response to an invitation to compile a small monograph on megaloblastic anemias for the general physician rather than the hematologist. In this endeavor the authors have very competently succeeded in compiling a short but comprehensive account of the megaloblastic anemias. The subject is covered under the general headings of concepts, therapeutic preparations, addisonian pernicious anemia, non-addisonian megaloblastic anemias, diagnosis, therapy, and references. An excellent index is included.

Especially complete is the chapter on non-addisonian megaloblastic anemias. All possible disease entities associated with megaloblastic anemia are discussed. With excellent judgment much of the controversial and technical minutiae have been omitted. The material presented can be readily understood and used by the general physician and nonhematologist internist, and should serve a very valuable function in elucidating and clarifying the megaloblastic anemias.

—DAVID L. DEUTSCH, Lt. Col., MC, USA

SURGICAL INFECTIONS, by *Edwin J. Pulaski,* Lieutenant Colonel, Medical Corps, United States Army. 332 pages; 10 illustrations. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $7.75.

This monograph of 332 pages is divided into two parts, the first covering antibiotic therapy and the second dealing with the management of surgical infection. Although the author begins the work by describing antibiotics, their history, use, and results, he drifts readily into the discussion of surgical principles and practices. In a concise manner he shows that antibiotic medication is an adjunct therapy and not a substitute for sound surgical measures. The value of antibiotics is stressed but their importance in the management of surgical infection is in conjunction with sound surgical principles.

The first section on antibiotics describes the various agents as to their properties, use, dosage, method of administration, and possible results. The second section on the management of surgical infections includes a concise but thorough discussion of specific infection, regional infection, and wounds involving all parts of the body, including chest, central nervous system, and abdomen. There is also a practical and organized approach to the treatment of burns, in which the author must have had a considerable experience.

In the busy routine of a physician's life it is difficult to keep abreast of all the late research and findings relative to the therapeutic use of antibiotics, because of the multitude of articles published in the journals. This monograph gives an opportunity for every doctor to acquaint himself with the latest developments and methods of use. Each chapter and the appendix supplies a large list of references, if any further reading and study is desired. Although further research undoubtedly will change and add to the present knowledge of antibiotics, this monograph presents today's knowledge of antibiotics and relegates them to their proper position in the treatment of surgical infection. —*JOSEPH M. HANNER, Capt. (MC) USN*

THE YEAR BOOK OF THE EYE, EAR, NOSE AND THROAT, (1953-1954 Year Book Series), edited by *Derrick Vail,* M. D., and *John R. Lindsay,* M. D. 455 pages; illustrated. The Year Book Publishers, Chicago, Ill., 1954. Price $6.

Each new edition of this well-known and invaluable volume seems better than the last. It would appear that the time is at hand, however, to separate the two specialties and establish one yearbook for ophthalmology alone and another for otolaryngology. The worth of such a work depends largely on the editor, who in addition to selecting from the voluminous and diverse literature on the subject also may exercise his right of inserting frequent editor's notes, which in this volume are practical, pertinent, and at times almost brilliant.

The section devoted to the eye consists of 252 pages of information carefully culled from the literature. Sections devoted to the ear and to the nose and throat, totaling 188 pages, are revelations to

those who may consider otolaryngology a decadent specialty. Even a casual reading of these sections indicates clearly that this specialty is more scientific and has more unexplored horizons than our predecessors ever dreamed of.

Particularly commendable is the organization of information within each section; for example, in the section on the eye it starts with diseases and abnormalities of the orbit per se, then continues in an orderly fashion through each of the structures of the eye itself, and concludes with surgery and therapy of the eye in general. In the aural section, anatomy and testing of hearing and vestibular function are clearly enumerated. A succinct presentation of recruitment is available for the student.

Even assuming that the majority of men in these fields are familiar with the pertinent literature in their specialty, this book is of value if only because of the chapter entitled "Miscellaneous." Here one finds material which is fascinating reading and of practical application. Certainly all physicians, even those highly specialized, should be aware of the condition of cardiac arrest. This work is a must for those who are active in these specialties, and yet it is sufficiently broad in scope for the general practitioner and the medical student.

—HENRY G. BULLWINKEL, Capt. (MC) USN

PERIMETRY, by *Josbua Zuckerman*, M. D. 391 pages; with 156 illustrations. J. B. Lippincott Co., Philadelphia, Pa., 1954.

This new textbook covers the subject of perimetry in a thorough and adequate manner and is an excellent interpretation of procedures and clinical evaluation of pathologic conditions in the visual fields. It is detailed enough for the experienced ophthalmologist and yet not too complex or technical for the beginning student to understand.

The book covers the entire subject of perimetry. It is divided into three parts: the language and vocabulary of perimetry for the benefit of the beginner; the various methods of examination, the equipment used in examination of the visual fields, the anatomy and physiology of the visual pathway, and the normal fields of vision, including the field findings in various pathologic conditions; and a review of the entire subject, which also includes supplementary data such as pitfalls in perimetry, mathematical aids in perimetry, and a fairly complete bibliography.

This book should be of interest not only to the ophthalmologist but also to the neurologist, neurosurgeon, and internist. It correlates the perimetric findings with other physical data obtained by internists and neurologists, and is of assistance in diagnosing disease of the brain and in many general medical conditions which have visual field changes. It should be part of the library of every ophthalmologist.

—JESSE H. SUITOR, Comdr. (MC) USN

NURSING IN CLINICAL MEDICINE, by *Julius Jensen*, Ph. D. (in Medicine), and *Deborah Maclurg Jensen*, M. A., R. N. 4th edition. 897 pages; illustrated. The Macmillan Co., New York, N. Y., 1954.

Instructors in nursing should welcome this up-to-date textbook through which the student can be quickly oriented to the scope of the subject. The authors have devoted the first two parts of this book to background information and to the development of medicine as a science. The general classification of diseases with their definitions should prove most helpful as an introduction to clinical medicine. The chapter devoted to the health team is particularly well presented and timely.

Part III presents a modified systemic approach to the study of medical nursing. Prevention, rehabilitation, and psychosomatic aspects of each disease, as well as the clinical aspects of nursing, are included in the general discussion. The questions and study projects for each unit, together with the extensive and up-to-date bibliographies, should be helpful to students as well as instructors.

This volume should help the student in nursing to develop positive attitudes toward health, to comprehend the need for understanding each patient in relation to his illness, and thus to achieve her objectives in the area of clinical medicine.

—*EILEEN FITZGERALD, Maj., ANC, USA*

THE YEAR BOOK OF DERMATOLOGY AND SYPHILOLOGY (1953-1954 Year Book Series), edited by *Marion B. Sulzberger*, M. D., and *Rudolf L. Baer*, M. D. 456 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1954. Price $6.

This new edition contains abstracts of articles relating to dermatology and syphilology from medical journals received from December 1952 through November 1953. It is divided into 11 sections on general dermatologic subjects (one is by the editors on "Some Advances in Dermatologic Management") which group the selected articles into broad categories, and contains a subject and author index for those interested in specific articles.

Although the editors apologize for the omission of many worth-while and important articles, by their selections they have attempted to present the year's most outstanding contributions to dermatologic literature. In some instances the articles seem to have been selected in an arbitrary manner, because other worth-while papers on the same subject were omitted. Regardless of this, the present volume continues the high standards established in previous years.

Of greatest value is the editors' review of advances in dermatologic management, written as a guide for the general practitioner. In addition, succinct editorial comments and criticism of the abstracts reveal the broad knowledge possessed by the editors. These criticisms are in

themselves worth the price of the book. This book enables the general practitioner and general medical military officer to manage the common skin diseases in a conservative and optimum manner. It belongs in the library of all dermatologists, students of dermatology, general practitioners, and medical military officers. Doctors Sulzberger and Baer should again be commended for their efforts in compiling a history of contemporary dermatology.—*ROBERT E. LYONS, Col., USAF (MC)*

FIFTY YEARS OF MEDICINE, by *Lord Horder,* M. D. 70 pages. Philosophical Library, Inc., New York, N. Y., 1954. Price $2.50.

Lord Horder, one of the most distinguished clinicians of our time, became a physician in 1896, one year after Roentgen announced the discovery of the x-ray. This little book contains three lectures delivered in December 1952, at the Royal Institute of Public Health and Hygiene in London in which the author reviews the progress in medicine he has seen in more than half a century.

The first fundamental change was the rise of clinical pathology, or as the writer expressed it, the taking of the laboratory to the bedside. Increased accuracy of diagnosis was the immediate result. Accounts are given of the progress in preventive medicine, chemotherapy, endocrinology, and cardiology; and of the advances in surgery, physical medicine, nutrition, and nursing. Perhaps the most interesting observations are those in the last lecture dealing with the possible future direction of medicine. The author points to the virtual disappearance of diseases such as chlorosis and scurvy, while many new conditions have been described. Some of these latter have been created by the injudicious use of new drugs and diets, and by excessive exposure to sunlight. Future fields for medical advances mentioned are eugenics, control of conception, noise abatement, voluntary euthanasia, and the medical care of the civilian population in war. The broad and philosophical approach makes the book of value to the medical man and well worth the short time it takes to read it.

—*LOUIS H. RODDIS, Capt. (MC) USN (Ret.)*

DISEASES OF THE LIVER, by *Mitchell A. Spellberg,* M. D. 646 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1954.

This volume is one of the most significant medical books published in recent months. Our present knowledge of the liver, and particularly some gaps in our knowledge, are presented in a most readable manner from the clinician's point of view. The chapters on laboratory tests, differential diagnosis of jaundice, and the liver in various diseases are especially outstanding.

An unusual feature of the text is the periodic use of dark, heavy type to indicate summaries of the preceding discussions. This feature makes it possible for the author to present much pertinent information concisely and accurately for a hurried reader. Excellent colored plates,

photographs, and photomicrographs add much to the over-all value of the volume. As is pointed out in the foreword, the bibliography of about 2,400 references indicates the exhaustiveness of the author's research. All internists will profit from this outstanding textbook.

—*WARREN H. DIESSNER, Col., MC, USA*

THE FUNDAMENTALS OF X-RAY AND RADIUM PHYSICS, by *Joseph Selman*, M. D. 340 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $8.50.

This text is concerned primarily with the application of physics to radiography, one chapter being devoted to radioactivity and radium. The author states that his purpose is to simplify the complex subject of radiologic physics for the student x-ray technician and, toward this end, he has done an excellent job. The standard subjects of energy, matter, electricity, and magnetism are well covered. The student is prepared for these subjects by the initial chapter on simplified mathematics, in which a brief review of elementary mathematical principles is presented. The basic units and concepts of radiography, such as kilovoltage, rectification, x-rays, electric generators, x-ray tubes and circuits, and the darkroom are all discussed in separate chapters. There is also a short section on the physical principles of special procedures such as laminography and stereoscopy. The final chapter is a brief description of protection in radiology.

The book is well-written and provides easy reading. Appropriate diagrams illustrate the physical principles discussed. The index is adequate and the references include the standard writings on the subject. This text is highly recommended for training a group of student technicians with no previous experience in an x-ray department. It is not written for the radiologist, but should prove extremely valuable under the circumstances mentioned.—*JOHN H. HEALD, Lt. (MC) USN*

MODERN PRACTICE IN ANAESTHESIA, edited by *Frankis T. Evans*, M. B. 2d edition. 622 pages; illustrated. Paul B. Hoeber, Inc., New York, N. Y., 1954. Price $12.50.

A general reference text of anesthesiology covering all aspects of this rapidly growing branch of medical practice, if complete, would be impractical and unwieldy. The editor of this book has succeeded to a great extent in overcoming this liability and staying within reasonable limits. There are faults however. The greatest of these is the lack of emphasis placed on the basic scientific and philosophical fundamentals of the art of anesthesia. There are too many uninformative illustrations, particularly those of equipment, and those emphasizing technical detail. The format suffers from being divided into many short, sketchy chapters devoted to anesthesia in specialty surgery. If effectively dealt with in one chapter, these considerations would emphasize the basic principles of good respiratory and cardiac physiology, body tone and relaxation, and the modalities of sensation which serve the various parts of the body.

With the new trend toward balanced anesthesia and the concurrent emphasis on muscle relaxants, the excellent chapter on the pharmacology and use of relaxant drugs, excluding succinylcholine (a relatively recent addition) is notable. There is definite lack of emphasis on oxygen therapy, resuscitation, and the poor risk patient. Citations in the text referring the reader to specific page and illustration numbers in standard reference works where the subject can be more adequately covered, would improve the text substantially. There is an index, but no table of contents or list of illustrations. The bibliography is extensive and parallels the development and application of curariform and synethetic relaxant drugs.—*STEWART A. WILBER, Lt. (MC) USN*

THE SURGERY OF PULMONARY TUBERCULOSIS, by *James H. Forsee*, Colonel, MC, USA. 208 pages; 59 illustrations, 1 in color; 11 graphs and 46 tables. Lea & Febiger, Philadelphia, Pa., 1954. Price $6.50.

This publication is based on careful observations made on about 1,000 patients treated for pulmonary tuberculosis at the Fitzsimons Army Hospital since 1947. It is divided into three parts. The first discusses the principles in the application of surgery in pulmonary tuberculosis; the second deals with operative surgical procedures; and the last describes, with supporting statistical data, experience with surgical therapy in pulmonary tuberculosis.

Resectional surgery in the treatment of pulmonary tuberculosis, tried before the beginning of the present century, was abandoned because of the prohibitively high mortality. Safer procedures, such as collapse operation, became popular. Since about the close of World War II, however, resectional surgery for diseased pulmonary tissue has become a reasonably safe procedure, due to the advent of new antibiotics, improved anesthesia, and more transfusions. The author has carefully observed this trend and affords the reader an understanding of the operative procedures and indications for their use. The results are early, but are indicative of success, in that 91 percent of the personnel treated by extirpative surgery are either well or their prognosis for complete rehabilitation is excellent.

The section describing operative procedures is brief and would not be adequate for a beginner, however, I believe the author's purpose is to describe the present trend and viewpoints relative to surgical therapy, rather than to provide detailed descriptions of surgical technics. The bibliography is small, but adequate to the subject. Fitzsimons Hospital has had a large series of cases, and these have been carefully studied and followed. In time, medical and nonsurgical methods may be found which will make unnecessary the surgical procedures used at present, but as things stand now, the book represents a late review of surgery as one of the methods used in the therapy of diseased pulmonary tissue due to tuberculosis.—*JOSEPH M. HANNER, Capt. (MC) USN*

ALCOHOLISM, by *Jackson A. Smith,* M. D. 72 pages. J. B. Lippincott Co., Philadelphia, Pa., 1954. Price $3.

This small volume of six chapters on alcoholism is offered as an inclusive but concise, presentation of the presently recognized forms of therapy in this condition. It is written essentially as a guide to the general practitioner in the handling of alcoholic patients and although there is one chapter on psychotherapy with the chronic alcoholic, the greatest emphasis is put on the various types of medical treatment. It opens with a chapter discussing the diagnostic features of a chronic alcoholic and describing the progressive physical and psychological deterioration that occurs in the typical case. The last chapter, "Treatment of Alcoholism in General Practice," is a general summary of the contents of all the previous chapters. These chapters cover the Antabuse-alcohol reaction treatment, the aversion treatment, vitamin therapy, adrenocortical extract therapy, sedation, psychotherapy, and Alcoholics Anonymous.

Although interesting, there is nothing essentially new presented in this little book. Combined with the conciseness of the discussion this seems to make the volume lack stature and authority in its presentation. The most valuable feature for one interested in alcoholism is the extensive bibliography of more than 85 references covering practically every approach to the subject.

—*DAVID S. EVANS, Lt. Col., USAF (MC)*

THE YEAR BOOK OF NEUROLOGY, PSYCHIATRY AND NEUROSURGERY, edited by *Roland P. Mackay,* M. D.; *Nolan D. C. Lewis,* M. D.; and *Percival Bailey,* M. D. 604 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1954. Price $6.

This yearbook is divided into sections on neurology, psychiatry, and neurosurgery. It contains well-written abstracts of the most important articles on these specialties appearing in journals dated November 1952 to October 1953. All phases of each specialty are included, and the articles are fairly well illustrated with photographs. Subject matter is indexed as to author and title.

The abstracts on neurology contain numerous articles on the neurotrophic viruses and their subdivisions. Warning is voiced by the editor on the use of spinal anesthesia, myelography, and cerebral arteriography, because of the numerous incidents of complications resulting from their use. Convulsive disorders and their treatment occupy their usual prominent position.

In the section on psychiatry, the editor emphasizes the continued need for clinical research in mental medicine and outlines a definite objective for such a program. The topics under general psychiatry include a wide selection, such as the ecology of mental disease, studies in mortality of patients with mental disorders, and patterns of biochemical organization. The section on child psychology stresses

the mother and child relationship during the first year, and describes how disturbance of this relationship may produce many behavior problems. The articles on schizophrenics are aimed at gaining an understanding of the feelings of the patient, in order to make possible a more effective therapy. Barbiturate intoxication is discussed in regard to prompt diagnosis and active treatment. Electroshock and psychosurgery and their results are also discussed.

In the neurosurgical section, articles on arteriography, ventriculography, and electroencephalography discuss the relative values and the advances in localization of brain tumors by the use of radioactive isotopes and dyes. The developments in the treatment of vascular lesions of the brain and of herniated disks, as well as the surgery of epilepsy, are adequately reviewed. The section on technic covers the use of controlled hypertension and artificial hibernation in brain surgery.

This book will be of most value to the busy specialist whose time for keeping up with the literature is limited. He will find it extremely useful for reviewing the abstracts pertaining to his more perplexing cases.—*WILLIAM J. JAMES, Comdr. (MC) USN*

HISTOPATHOLOGIC TECHNIC AND PRACTICAL HISTOCHEMISTRY, by *R. D. Lillie*, M. D. 501 pages. The Blakiston Co., Inc., New York, N. Y., 1954. Price $7.50.

The second edition of this comprehensive reference book on tissue staining technic is brought up to date by the addition of 201 new pages. The arrangement of subjects is generally unchanged but the original chapters are revised and greatly expanded.

The author's major emphasis is on special staining technics for the demonstration of specific cellular structures and for the identification of their chemical composition. As such, it is a useful reference for any laboratory where differential staining problems are frequently encountered. For the inexperienced technician, however, the description of each procedure is inadequate, and too little advice is given about the pitfalls usually encountered and how to overcome them. There is also insufficient discussion concerning the choice of procedure, detailing advantages and disadvantages of one method compared with another, and of the results to be expected and how they should be interpreted. Although there are no illustrations, none seem to be needed.

The book does present a remarkable amount of up-to-date information on histopathologic technic, including many new practical tables of data. It should find its greatest usefulness in the laboratories of well-trained and experienced tissue technicians and special research workers, rather than as a textbook or handbook for the use of beginning technicians.—*CHARLES G. BRATENAHL, Lt. Comdr. (MC) USN*

GRENZ RAY THERAPY, by *Gustav Bucky*, M. D., and *Frank C. Combes*, M. D. 204 pages; illustrated. Springer Publishing Co., Inc., New York, N. Y., 1954. Price $8.50.

The authors have produced a text which, according to the preface, "explains, in simple terms, the physics of grenz radiation, discusses methods, and gives details of grenz ray therapy, including indications, limitations, and clinical results." The book is divided into two sections of six chapters each, the first devoted essentially to the physics of grenz radiation and the second to its application in dermatologic, tropical, oral, and ophthalmologic diseases. Dr. Bucky has written six chapters.

The section devoted to physics is not clearly written, and confusion and doubt results. The chapter on "Ionization in Biologic Materials" is very important but not readable. There is some disagreement between page 10 and page 19 as to whether or not different wave lengths produce different biologic effects. On page 51 we find a chart with the legend "Rost's absorption columns computed with the aid of Guilleminot's chart for a radiation quality of 8 degrees of a Benoist meter." Very little other information is supplied and the reference that would explain this chart was published in Germany in 1915.

The meat of the book is Dr. Combes's 50-page chapter on "Grenz Ray Therapy in Skin Diseases." It contains indications, contraindications, and recommended dosage for almost any disease one might wish to treat. Anyone who intends to do grenz ray therapy would do well to consult this book, but one cannot expect to learn radiation physics from the discussion provided here. It would have been helpful if the authors had provided a section on what to look for in the selection and purchase of a grenz ray generator.

—*JAMES F. MORRELL, Lt. (MC) USN*

FLUID AND ELECTROLYTE THERAPY, by *Franklin L. Ashley*, M. D., and *Horace G. Love*, M. D. 72 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1954. Price $3.

This handy little book is primarily designed as a guide for the use of internes and residents. It can easily be read in an evening but the material it contains certainly cannot be absorbed by the beginner in this subject even after several readings. Technical details are confined to the first few pages and though brief in comparison with other recent manuals on this subject, are considered adequate enough for a basic understanding of the problem. The book is well organized. All diagnostic signs are outlined, the danger signals discussed, and appropriate remedial action given. This volume should give one the basis for the establishment of an excellent basic knowledge of fluid and electrolyte therapy. —*HAROLD A. CONRAD, Col., MC, USA*

NEW BOOKS

Books received by the *U. S. Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be selected for review in a later issue.

MEDICAL USES OF CORTISONE, Including Hydrocortisone and Corticotropin, edited by *Francis D. W. Lukens*, M. D., Professor of Medicine, University of Pennsylvania, School of Medicine; Director, The George S. Cox Medical Research Institute, University of Pennsylvania, Philadelphia, Pa. 534 pages; illustrated. The Blakiston Co., Inc., New York, N. Y., 1954. Price $7.50.

THE DOCTOR WRITES, An Anthology of the Unusual in Current Medical Literature, edited by *S. O. Waife*, M. D., F. A. C. P. 175 pages. Grune & Stratton, Inc., New York, N. Y., 1954. Price $3.75.

VETERINARY NECROPSY PROCEDURES, edited by *Thomas Carlyle Jones*, Lt. Col., VC, USA, Chief of the Section of Veterinary Pathology and Registrar, Registry of Veterinary Pathology (1946-1950), (1953-), Armed Forces Institute of Pathology, and *Chester A. Gleiser*, Lt. Col., VC, USA, Chief of the Section of Veterinary Pathology and Registrar, Registry of Veterinary Pathology (1950-1953), Armed Forces Institute of Pathology. Sponsored by The Armed Forces Institute of Pathology and The American Veterinary Medical Association. 136 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1954. Price $7.50.

LECTURES ON THE SCIENTIFIC BASIS OF MEDICINE, Volume II, 1952-53, by British Postgraduate Medical Federation, University of London. 380 pages; illustrated; 29 plates. Published by The Athlone Press at the Senate House, London, W.C.1, 1954. Distributed in U. S. A. by John de Graff, Inc., New York, N. Y. Price $6.

PERCEPTION, A Transactional Approach, by *William H. Ittelson* and *Hadley Cantril*, Princeton University. Doubleday Papers in Psychology, DPP 7. 33 pages. Doubleday & Co., Inc., Garden City, N. Y., June 1954. Price $0.85.

THE LABORATORY DIAGNOSIS OF LEPTOSPIROSIS, by *J. W. Wolff*, M. D., Professor of Tropical Hygiene, University of Wageningen; Bacteriologist, Institute of Tropical Hygiene and Geographical Pathology, Royal Tropical Institute, Amsterdam, The Netherlands. American Lecture Series, Publication Number 183, A Monograph in American Lectures in Tests and Techniques. Edited by *Gilbert Dalldorf*, M. D., Director, Division of Laboratories and Research, New York State Department of Health, Albany, N. Y. 99 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $3.75.

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